

FORCHAMMERIA WATSONI Rose, n. sp.

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U. S. DEPARTMENT OF AGRICULTURE.
DIVISION OF BOTANY.

CONTRIBUTIONS

FROM



THE U. S. NATIONAL HERBARIUM.

Vol. I.

REPORTS ON COLLECTIONS, AND MISCELLANEOUS PAPERS.

LISTS OF PLANTS, WITH DESCRIPTIONS OF NEW SPECIES, COL-
LECTED CHIEFLY IN THE SOUTHWESTERN UNITED STATES,
WESTERN MEXICO, AND ADJACENT ISLANDS; INDEXES
OF NEW AMERICAN SPECIES AND PLANT NAMES
PUBLISHED IN 1891 AND 1892; SPECIAL
NOTES AND OBSERVATIONS.

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PREFATORY NOTE.

In the act of Congress making appropriations for the Department of Agriculture for the fiscal year ending June 30, 1889, provision was made for botanical exploration and the collecting of plants in little known districts of America in connection with the U. S. National Herbarium; and since that time a similar provision has been made annually. As a partial result of this appropriation the Division of Botany has issued heretofore two completed volumes, II and IV, of a series of publications entitled Contributions from the U. S. National Herbarium. The present volume, issued in nine parts, is made up chiefly of reports on collections made by Dr. Edward Palmer in the southwestern United States and adjacent portions of Mexico, together with other collections made by agents of the Government.

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PLANTS FROM SOUTHERN CALIFORNIA.

By DR. GEO. VASEY and J. N. ROSE.

During June and July, 1888, Dr. Edward Palmer collected for the Department of Agriculture in the counties of Kern, Tulare, and San Bernardino. The early part of June he collected on the Green Horn Mountain and on the North Fork of Kern River, Kern County; the last of June was spent at Victor, in San Bernardino County, and the month of July was spent in Long Meadow and the surrounding country, in Tulare County.

Thanks are due to Dr. Sereno Watson for the determination of some new and difficult species, and to Mr. F. V. Coville for help in determining a number of species.

The following paper contains a list of the species with Dr. Palmer's field notes:

Nos. 18 to 31. Collected on the North Fork of Kern River, near Kernville, Kern County, Cal., June 7 to 15.

18. *Equisetum lævigatum*, A. Br.

19. *Juncus effusus*, L.

20. *Juncus Nevadensis*, Watson.

21. *Juncus* sp.

Nos. 18, 19, 20, and 21. Found at the border of river in wet locations.

22. *Juncus*, sp. Found in a damp meadow near river.

23. *Elymus triticoides*, Nutt. Common in rather low places near river, growing so thickly as to seem artificially sown. Cattle eat it only when young.

24. *Sporobolus airoides*, Torr. Grows in wet meadows and along water-courses. Cattle eat it green and as hay.

25. *Panicum dichotomum*, L. Found on sandy spot near river.

27. *Festuca Myurus*, L. Grows very thick in meadow near river.

28. *Polypogon littoralis*, Smith.

29. *Polypogon Monspeliensis*, Desf.

30. *Agrostis verticillata*, Trin.

Nos. 28, 29, and 30 were found in a wet meadow near river.

Nos. 32 to 107 and 150 to 160 were collected under pines, at a height of 6,000 or 7,000 feet, upon the Green Horn Mountains, 10 or 12 miles west of Kernville, Kern County, Cal., June 7 to 15, 1888.

32. *Nemophila parviflora*, Doug. Grows close to the ground, under shade of bushes. Flowers light lilac.

33. *Chænactis santolinoides*, Greene. Large, compact plant, 2 feet high; blossoms freely. Flowers creamy white.

34. *Comandra umbellata*, Nutt. A loose, scraggy plant, growing sparsely upon hill-sides. Flowers dingy white.

35. *Eriogonum vagans*, Watson. Very common. Found under pines and oaks upon slopes and level places upon ridges.

36. *Gilia androsacea*, Steud. Very common, growing under trees, and also in unprotected places. Flowers white.
37. *Hemizonella Durandi*, Gray. Abundant in moist, rich soil. Flowers yellow.
38. *Ribes Menziesii*, Pursh. Forms thick bushes, 3 to 5 feet high, producing abundantly a spiny fruit of old-gold color, which is utilized by the inhabitants, who, by cooking and removing the hulls, make it into jam.
39. *Gilia androsacea*, Steud. Grows abundantly under trees. The white, fragrant flowers change to pink, which takes on a purple tinge in drying.
40. *Krynitzkia muriculata*, Gray. Grows sparsely on dry exposed places. Blossom white.
41. *Krynitzkia ambigua*, Gray. Common under oaks and pines. Flowers white.
42. *Mentzelia dispersa*, Watson. Habitat as 41. Flowers yellow.
43. *Hosackia sericea*, Benth. Not common. Grows upon sloping banks among other plants. Flowers yellow.
44. *Eschscholtzia peninsularis*, Greene. Only a few plants, nearly past blooming, were seen.
45. *Salvia* sp. Found upon exposed hill-sides, appearing as if artificially sown. The Mexicans and Indians call this "Chia." They make from the seeds a cooling beverage.
46. *Mentzelia congesta*, Torr. & Gray. Scattered thinly among grasses and other plants. Flowers yellow.
47. *Lathyrus Bolanderi*, Watson. Grows 2 or 3 feet high at the foot of bushes. Flowers are at first cream color, changing gradually to wood color, then to snuff color. All these changes may be observed upon one plant.
48. *Sanicula tuberosa*, Watson. Grows in the shade of other plants and bushes. Flowers yellow.
49. *Eriophyllum cæpitosum*, Dougl., var. *latifolium*, Gray. Found in exposed situations. Gaudy flowers of dark orange hue.
50. *Lemmonia Californica*, Gray. Very common on slopes of shady banks. Flowers white.
51. *Layia glandulosa*, Hook. & Arn. Grows in exposed situations. Flowers white.
52. *Trifolium pauciflorum*, Nutt. Grows in thick masses near springs. The wine-colored flower is tipped with white.
53. *Trifolium microcephalum*, Pursh. Habitat as 52. Flowers lavender.
54. *Chænactis heterocarpha*, Gray. Grows on exposed hill-sides. Flowers orange-colored.
55. *Convolvulus villosus*, Gray. Grows close to the ground in shady places upon hill-sides. Flowers canary yellow.
56. *Tellima Cymbalaria*, Walp. Common among other plants in rich, moist locations. Flowers white.
57. *Gilia achilleæfolia*, Benth. Found on level spots under oaks and pines among other plants.
58. *Chænactis Xantiana*, Gr. Habitat as 57. Flowers creamy white.
59. *Chamæbatia foliolosa*, Benth. Common; large numbers growing together in shade and in sunlight. From 1 to 1½ feet high. Flowers white, the petals falling soon.
60. *Erysimum asperum*, D. C. Grows sparsely. Flowers orange.
61. *Thysanocarpus curvipes*, Hook. Common upon hill-sides among other plants. Flowers white.
62. *Evax caulescens*, Gray. Found in clusters by themselves, in exposed localities.
63. *Geranium incisum*, Nutt. Grows in bunches in ravines. Flowers lilac.
64. *Polygonum imbricatum*, Nutt. Abundant in wet places, among grasses and other plants.
65. *Rubus Nutkanus*, Moc. Shrub 3 to 5 feet high growing in cañons. Flowers white.

66. *Godetia viminea*, Spach. Abundant in exposed situations. Showy plant. Flowers satiny white, blotched with plum color.
67. *Collinsia grandiflora*, Dougl. Abundant under shade of trees. Flowers creamy white.
68. *Collinsia Wrightii*, Watson. Proc. Amer. Acad., XXIV. (A part of the type). Habitat as 67. Flowers blue and white.
69. *Monardella linoidea*, Gray. Grows in shade upon hill-sides, in clumps. Very few in flower. Color light purple. Fragrance like Bergamot.
70. *Arabis repanda*, Watson. Moist shady localities. Flowers white.
71. *Pentstemon breviflorus*, Lindl. Many stems, grows among rocks and bushes. Flowers creamy-white.
72. *Delphinium simplex*, Dougl. Found upon hill slopes at the roots of other plants.
73. *Eriogonum virgatum*, Benth. Grows in exposed localities. Flowers sulphur-yellow.
- 74a. *Mimulus montioides*, Gray.
- 74b. *Mimulus nasutus*, Greene. In shady places near springs. Flowers orange color with snuff-colored dots and markings.
75. *Mimulus moschatus*, Dougl. Found near springs. Flowers yellow, with strong odor of musk.
76. *Madia elegans*, Don. In shady places, among other plants. Flowers close in day.
77. *Monardella villosa*, Benth., var. *leptosiphon*, Torr. Found in shade upon hillsides. Flowers lilac, with mint fragrance.
78. *Gilia glutinosa*, Gray. Common in shady and exposed positions, among other plants. Flowers violet color.
79. *Phacelia curvipes*, Torr. Found in moist places near springs. Flowers violet.
- 80a. *Viola pedunculata*.
- 80b. *Viola præmorsa*, Dougl. Grows in level places among other plants.
81. *Gilia tenella*, Benth. Common in shade of trees upon hills. Flowers pink.
82. *Brodiaea laxa*, Watson. Bulbous plants growing in low places among other plants. Flowers bluish purple.
83. *Brodiaea ixioides*, Watson. Habitat of 82.
84. *Gomphocarpus tomentosus*, Gray. Plant grows with three or four stems and has an unusually white appearance. Flowers garnet color.
85. *Gomphocarpus cordifolius*, Gray. Grows in exposed places, throwing up several stems. The first leaves have a bronzed look which fades in drying. Calyx seal-brown, then cherry-red, petals dirty white.
86. *Mimulus nanus*, Hook. and Arn. Common in both exposed and in shaded localities. Flowers showy bright cherry-red, lower part of the tube yellow.
87. *Symphoricarpus mollis*, Nutt. Small bush, 3 feet high, found in ravines.
88. *Vicia Americana*, Muhl., var. *truncata*, Brewer. Grows among bushes, under trees. Flowers violet.
89. *Lathyrus palustris*, L., var. *myrtifolium*, Gray. Habitat as 88. Flower dark cherry-red.
90. *Rhamnus crocea*, Nutt. Compact evergreen shrub, 3 feet high, grows upon upper edge of a ravine.
92. *Orthocarpus purpurascens*, Benth. var. *Palmeri* Gray. Low places among plants. Flowers dark lilac.
93. *Anisocoma acaule*, T. & G. Found on exposed hill-sides. Plant very succulent. Flower yellow.
94. *Iris Hartwegi*, Baker. Grows upon level rich soil, several plants near each other. Flowers at first lilac, fading later to lavender.
95. *Brodiaea capitata*, Benth. Found in low moist places.
96. *Habenaria Unalaschensis*, Watson. Grows in the shade, in low moist places

97. *Oenothera gauraeflora*, T. & G. Not common. Plant 2 to 3 feet high, growing in rather shady situations in rich soil. Flowers white.
98. *Cornus Californica*, Meyer. A loose growing shrub 3 to 5 feet high, found near springs in low moist soil. Flower white.
99. *Polygonum Bistorta*, L. Found in a swamp near spring. Flower white.
100. *Cynoglossum occidentale*, Gray. Grows on level ground with rich soil. Flower greenish snuff-color.
101. *Ribes sanguineum*, Pursh. Plant a shrub of loose branching habit, 5 to 6 feet high. In cañons.
102. *Ranunculus Californicus*, Benth. Grows in rich moist bottoms, near springs. Flower golden yellow.
103. *Aquilegia truncata*, Fisch. & Mey. Damp shady locations.
104. *Gilia grandiflora*, Gray. In shade on hill-sides. Very sparse. Flowers old-gold color.
105. *Helianthus* (?) *invenustus*, Greene. (Pitt. I, 284.) (The type of the species). Grows on level places in low rich soil, in large clusters. Flower golden yellow.
- 106a. *Balsamorhiza deltoidea*, Nutt.
- 106b. *Helianthella Cymbalaria*, Pursh. Habitat as 105. No flowers.
Nos. 107 to 150. Plants collected on the North Fork of Kern River, near Kernville, Kern County, Cal., June 7 to 15.
108. *Ranunculus Cymbalaria*, Pursh. Wet valley near river; found it also in wet places upon Green Horn Mountains. Flower yellow.
109. *Horkelia*, sp. Grows in gravelly spot near river. Only one specimen with one spike of flowers found.
110. *Trifolium tridentatum*, Lindl. Found but one plant, in a wet grassy meadow.
111. *Rumex salicifolius*, Weinman. In a gravelly "washout" near river.
112. *Lupinus brevicaulis*, Watson. Same habitat as 111. Flower white above, blue at the lower part.
113. *Lupinus micranthus*, Dougl. Same as 112. Flower very small.
114. *Lupinus confertus*, Kell. On the edge of wet meadow. Flower at first lavender, then the standard becoming snuff-colored, and the keel, wood color.
115. *Lupinus Stiveri*, Kell. Found on a sandy spot in river bottom. Compact plant. Profuse bloomer. Flower standard yellow, keel silvery pink, which in drying fades to blue.
116. *Nicotiana Bigelovii*, Watson. Very common plant. Flower white.
117. *Hosackia decumbens*, Benth. Trailing, found on gravelly spots near river banks.
118. *Eriogonum saxatile*, Watson. Habitat as 117.
119. *Eriogonum virmineum*, Dougl. Habitat as 117.
120. *Eriogonum virgatum*, Benth. Habitat as 117.
121. *Erigeron caespitosum*, Nutt. Habitat as 117. Flowers lilac.
122. *Erigeron divergens*, T. & G. Found in wet meadows, near river banks.
123. *Oenothera Californica*, Watson. Gravelly situations near river banks. Flower white.
124. *Ranunculus aquatilis*, L., var. *trichophyllus*, Gray. Abundant in river and water ditches. Flower white.
125. *Abronia turbinata*, Torr. Abundant in gravelly meadows near river. Flowers fragrant, white.
126. *Monardella candicans*, Benth. Grows sparsely in gravel near river. Flowers white, with mint fragrance.
127. *Gilia Matthewsii*, Gray. Grows plentifully on level places in gravel near river. Blossom pink with dark purple throat.
- 128a. *Krynitzkia muriculata*, Gray.
- 128b. *Krynitzkia circumscriba*, Gray. Habitat as 127.

130. *Lessingia leptoclada*, Gray, var. *microcephala*, Gray. Common on dry hill-sides, in places that have been closely grazed by sheep.
131. *Hemizonia Heermanni*, Greene. Plant common where sheep have been pastured until all vegetation has been destroyed. It has an offensive odor.
132. *Matricaria discoidea*, D C. Found in low moist places. Odor like "dog-fennel."
134. *Gilia floccosa*, Gray. Scattered, on a sandy place near the river. Flower, white.
135. *Galium trifidum*, L., var. *latifolium*. Found among bushes on river bank.
136. *Ranunculus Cymbalaria*, Pursh. Grows in wet meadow.
137. *Gilia inconspicua*, Dougl. Found on sandy spots near river, also upon the Green Horn Mountains. Flower pink, with white throat.
138. *Eriogonum angulosum*, Benth. Found near the river upon sand gravel.
139. *Glycyrrhiza lepidota*, Nutt. Grows along river banks.
140. *Castilleja stanantha*, Gray. Found in wet places among grasses and other plants. Flower scarlet.
141. *Boisduvalia densiflora*, Watson. Found in wet meadows with other plants. Flowers white.
142. *Trifolium involucratum*, Willd. Abundant in wet meadows.
143. *Hosackia Purshiana*, Benth. Habitat as 142, with which it is mowed for hay.
- 144a. *Stachys albens*, Gray.
- 144b. *Stachys ajugoides*, Benth. Wet places beside river. Flower strong, weedy odor.
145. *Lepidium intermedium*, Gray. Gravelly soil near river.
146. *Scutellaria angustifolia*, Pursh. Found in damp, sandy soil near river. Flower navy-blue.
147. *Erythraea Douglasii*, Gray. Found in a damp, shady locality near banks of river.
148. *Mimulus floribundus*, Dougl. In moist, sandy soil near river.
149. *Cuscuta decora*, Choisy. Grows in wet meadows in thick bunches. Flowers white; fragrant.
150. *Krynitzkia angustifolia*, Gray. Dry, sandy gravel near river bank.
152. *Hieracium horridum*, Fries. Grows in large clusters in exposed nooks in rocky masses, out of the direct rays of the sun. Flowers yellow.
153. *Sagina occidentalis*, Watson. Abundant in a wet gully formed by a spring.
154. *Mimulus exilis*, Durand. Grows thickly in a moist, grassy bottom. Flower yellow.
155. *Gayophytum diffusum*, T. & G. Found on mountain slopes in shade of bushes. Flower white, changing to pink at night as it closes up.
- 156a. *Gayophytum racemosum*, T. & G.
- 156b. *Gayophytum pumilum*, Watson. Very common on sandy or stony mountain ridges. Flower white.
157. *Pentstemon glaber*, Pursh. Found on mountain slopes. Flower purplish-blue.
158. *Chaenactis Douglasii*, Hook. & Arn. Grows in good soil at the edge of a low run. Flower creamy-white.
159. *Kelloggia galioides*, Torr. Found in rather shady situation. Flowers white within, rose colored outside.
160. *Apocynum androsaemifolium*, L., var. *pumilum*, Gray. Grows in rich low ground. Found only one plant in flower.

Nos. 161-223. Collected at Long Meadow, July 7 to 14. Long Meadow, Tulare County, Cal., situated 8,000 to 9,000 feet above sea-level, 20 miles due north from Kernville, being two days' journey by a circuitous route in the Sierra Nevada Mountains. The meadow has water-courses of different extent, and the soil is more or less swampy. It is surrounded by an irregular, broken mountain country.

161. *Mimulus primuloides*, Gray. Common, growing in clusters in a grassy marsh. Corolla yellow; the throat has a few brown dots, with a larger one fully exposed above them; this has another upon either side.
162. *Hosackia oblongifolia*, Benth. Common in grassy swamp. Flower; keel, canary color; standard, orange color.
163. *Stellaria longipes*, Goldie.
164. *Stellaria crispa*, C. & S.
165. *Galium trifidum*, L.
163, 164, and 165 in moist, grassy bottoms among other plants.
166. *Laurentia carnosula*, Benth. Somewhat rare. Found by the side of a small stream that drains a grassy marsh. Flowers blue, with white center.
168. *Bahia Palmeri*, Watson. Proc. Amer. Acad., XXIV, 83. Growing sparsely at the base of slopes. Flower creamy. Type.
170. *Horkelia fusca*, Lindl. Very common on rather dry bottoms. Flower white.
171. *Potentilla glandulosa*, Lindl, var. *Nevadensis*, Watson.
173. *Ivesia santolinoides*, Gray. Very common on rocky slopes. Flowers white.
174. *Spraguea umbellata*, Torr. Found in rich, moist locations.
175. *Hulsea vestita*, Gray. In bunches on sloping sides of ridges. Flower cherry-red upon outside, orange-yellow in center.
176. *Mimulus deflexus*, Watson. Proc. Amer. Acad., XXIV, 84. Found on the dry borders of low, wet places. Flowers, lower part of petals, plum-color upper, orange. Type.
177. *Polygonum tenue*, Mx. Grows in clusters at the dry borders of a marsh.
178. *Aster Andersoni*, Gray. Found in wet bottoms. Flowers purplish-blue.
179. *Eriogonum stellatum*, Benth. Found on sides of stony ridges.
180. *Trichostema oblongum*, Benth. Plants clustered together, forming compact masses among thickly growing grasses. Very offensive odor.
181. *Eriogonum spergulinum*, Gray. Very common on low hill slopes.
182. *Trifolium monanthum*, Gray. Found in grassy swamps. Petals white, bronze blotch in center.
183. *Krynitzkia affinis*, Gray. Common, shady, rich location near water.
184. *Draba stenoloba*, Ledeb. Found on wet bottoms. Flowers white.
185. *Silene Bernardina*, Watson. Proc. Amer. Acad., XXIV, 82. Grows on shady slopes. Flower dingy-white. Type.
186. *Heuchera rubescens*, Torr. Found in large bunches, somewhat shaded by rocky ledges. Flowers white.
187. *Spiraea discolor*, Pursh., var. *ariaefolia*, Watson. A shrub 4 to 5 feet high, of irregular growth. Rocky soil.
188. *Pentstemon Menziesii*, Hook. Found in large bunches on rocky slopes. Flowers dark crimson, with white center.
189. *Krynitzkia Californica*, Gray. Found among other plants, bordering a wet, grassy bottom.
190. *Krynitzkia Californica*, Gray. Habitat as 189.
191. *Lupinus Breweri*, Gray. Found close to the ground, in round bunches, on rocky slopes. Flowers purplish-blue.
192. *Arabis platysperma*, Gray. In shade of pines.
193. *Velæa vestita*, Coulter & Rose. At the base of ridges in shade of trees and bushes.
194. *Arnica foliosa*, var. *incana*, Gray. Very common in the drier portions of grassy bottoms. Many plants growing together, forming irregular masses. Flowers yellow.
195. *Arenaria pungens*, Nutt., var. *gracilis*. Prostrate, numerous, in rounded masses. Flower white.
196. *Eriogonum spergulinum*, Gray. Common; found upon level places under shade of pine, so numerous that the white flowers attract attention.

197. *Claytonia Chamissonis*, Esch. Common along the edges of small rivulets that drain grassy swamps. Succulent plant. Flowers white.
198. *Veronica Americana*, Schwein. Habitat as 197. Flower blue.
199. *Viola blanda*, Willd. Common with grasses in swamp.
200. *Ledum glandulosum*, Nutt. Plant about 3 feet high, growing in clusters on the edge of a grassy swamp, surrounded by pines. Saw it in this locality only.
201. *Zauschneria Californica*, Presl. Small plant found upon the slope of a ridge. Flower crimson.
202. *Gilia* sp. Found in bunches in the shade of pines upon slopes. Flower white, variegated with lilac.
203. *Sidalcea Californica*, Gray. Grows in grassy swamps. Flower rose-color, white base.
204. *Eriogonum marifolium*, T. & G. Abundant. Under pines, in a light soil in a bottom, surrounded by a rocky ridge.
205. *Phacelia ramosissima*, Dougl. Found growing among large rocky masses. Flower lavender color.
206. *Solanum umbelliferum*, Esch. Grows in groups among shrubs and rocks. Flower blue, shaded with lilac.
207. *Eriogonum Wrightii*, Torr. Grows on rocky ledges.
208. *Pentstemon Bridgesii*, Gray. Found on shady slopes. Flower scarlet.
209. *Artemisia discolor*, Dougl., var. *incompta*, Gray. Found in shady ravine. Strong odor.
210. *Eriophyllum confertiflorum*, Gray. In clusters among shrubs and pines. Flower golden-yellow.
211. *Hypericum formosum*, H. B. K. In grassy swamps. Flower golden-yellow.
212. *Dodecatheon Jeffreyi*, Moore. In grassy swamps. Flower rose, with white base.
213. *Hosackia crassifolia*, Benth. Found in shady ravines. Flower bronze-color.
214. *Galium multiflorum*, Kell. Found among bushes and rocks.
215. *Thalictrum sparsiflorum*, Turcz. Growing in grassy swamp under shade of bushes.
216. *Salix flavescens*, Nutt. Straggling shrub, 6 to 8 feet high, growing near a grassy swamp.
217. *Arabis perfoliata*, Lam. Flower white. Found in grassy swamps.
- 218, 219, 220, 221. *Epilobium alpinum*, L. The last four are found in grassy swamps. Flower white-rose color at night.
222. *Senecio triangularis*, Hook. Found in a ravine near running water. Flower yellow.
223. *Habenaria leucostachys*, Watson. Grows in grassy swamps. Flower white.
Nos. 223-226. Collected at Victor, June 25 to 27. Victor is 45 miles north of San Bernardino, in San Bernardino County, on the branch road from this place to the junction of the Atlantic and Pacific road.
- 223½. *Lycium Cooperi*, Gray. A rough, thorny shrub, 4 feet high. Fruit orange-colored.
224. *Kochia Americana*, Watson. Plant 2 feet high. Found at the edge of alkali bottom.
225. *Thelypodium integrifolium*, Endl. Very abundant plant in the rich soil of a grassy bottom. Have found specimens 9 feet high, which is very unusual. The leaves are cooked and eaten by the Indians. Cattle do not seem to feed upon this. Flowers white.
226. *Aphyllon Californicum*, Gray. Found among salt grasses on alkaline bottoms. The Indians use this as an article of food.

Nos. 227-230. Grasses collected at Victor, San Bernardino County, Cal., June 25 to 27, 1888.

227. *Paspalum distichum*, L.

228. *Phleum pratense*, L. Found at the border of the Mojave River, above the reach of animals.

229. *Elymus triticoides*, Nutt. Found in large patches looking like grain, in good soil, near springs on alkali bottoms.

230. *Sporobulus asperifolius*, Thurb. Found in large plots among other plants, outside an alkali flat bordering a pond.

Nos. 231-247. Grasses collected at Long Meadow, Tulare County, Cal., July 7 to 14.

231. *Deschampsia caespitosa*, Beauv., var. *confinis*, Vasey. Abundant in grassy marshes, so firmly rooted that it is difficult to obtain specimens with roots.

232. *Stipa occidentalis*, Thurb. Found in clusters with sparsely-growing pines, on low exposed divides.

233. *Bromus Orcuttianus*, Vasey. Widely dispersed upon slopes shaded by pines and oaks.

234. *Alopecurus aristulatus*, Michx. Rare; in large patches in moist, grassy bottom.

235. *Glyceria arundinacea*, Kunth. In the shade of bushes on the border of a swamp.

236. *Deschampsia elongata*, Munro. Very abundant in grassy swamps, on the borders of streams.

237. *Deschampsia elongata*, Munro.

238. *Agrostis scabra*, var. Common in wet meadows and on the banks of creeks.

239. *Agrostis scabra*, Willd. Found along streams of water; rare.

240. *Melica stricta*, Boland. Not common. Found in bunches under shade of trees upon mountain slopes.

241. *Deschampsia calycina*, Presl. Found upon grassy bottoms that had become dried.

242. *Poa Bolanderi*, Vasey. Somewhat dispersed through a grassy bottom.

243. *Elymus Sitanion*, Schultz. Rare, on slopes among other plants.

244. *Stipa stricta*, Vasey. Same habitat as 243.

245. *Agropyrum glaucum*, R. & S. A single plant found in a swampy place among other grasses.

246. *Festuca microstachys*, Nutt. Found at the base of a slope, in the shade of bushes.

247. *Juncus Nevadensis*, Watson. Found in grassy swamps along streams.

LIST OF PLANTS COLLECTED BY DR. EDWARD PALMER IN LOWER CALIFORNIA IN 1889.

By GEORGE VASEY and J. N. ROSE.

In volume XI of the Proceedings of the U. S. National Museum we published an account of the plants of San Quentin and a partial report on those collected about Lagoon Head. The present paper will begin with the Lagoon Head plants, and will include a list of the species of Cedros, San Benito, and Guadalupe Islands. Mr. T. S. Brandegee, of the California Academy of Science, collected over some of the same ground visited by Dr. Palmer, and has rediscovered several of the new species described in the former paper. And now several of the species recently described by him are included in the present list. We are indebted to a number of botanists for assistance in the working up of these plants; especially to Dr. Sereno Watson, who has carefully looked over doubtful forms, and to Mr. William Canby, who has generously loaned us many specimens. Other botanists who have aided us in identifying species will be referred to in the proper place. In this paper we give reference to the first publication of the species, under the genus in which it is now included, when not found in the Botany of California or Gray's Syn. Flora.

PLANTS OF LAGOON HEAD.

A partial list of the plants of this region has been published in the Proceedings of the National Museum, vol. xi, pp. 534-536.

Lagoon Head, Lower California, the Cabo Negro of the old Spanish charts, is a high, dark-colored headland of volcanic origin; its highest point is 475 feet above high-water mark, and in clear weather it can be seen at a distance of 30 to 40 miles, presenting the appearance of an island.

794. *Eschscholtzia peninsularis* Greene. Bull. Cal. Acad., I. 68. In the sand plain back from the ocean. Only a few plants found in bloom.

823. *Eschscholtzia minutiflora* Watson. Found in a cañon 30 miles inland, growing in sandy soil; "roots quite red." If this is correctly referred, the range of the species is extended considerably southward.

834. *Biscutella Californica* B. & H. Mr. Watson thinks this may be distinct from *B. Californica*. Dr. Palmer reports it very common on the sandy hills and plain near the beach. The "yellowish white" becoming purple in drying.
815. *Arabis pectinata* Greene. Pitt. I. 287. This recently described species of Mr. Greene was collected this season by Lieutenant Pond at San Bartolome Bay and also on Cedros Island by Dr. Palmer. Collected on sandy spot among hills 40 miles back from the ocean. "Bloom white changed to mauve by age."
821. *Sisymbrium Brandegeana* Rose, n. sp. Annual, glabrous, slender, simple or branching, 6 to 15 inches high: leaves small (1 to 2 inches long), pinnately divided into a few filiform segments: petals one and one-half lines long, twice the length of the sepals, white: pods three-fourths of an inch long, terete, horizontal, or sometimes becoming reflexed, sometimes straight but mostly curving upward, tipped with a thick, obtuse style (one line long), on short pedicels. Common in shady soil about the beach.
767. *Drymaria viscosa* Watson. Proc. Amer. Acad., XX, 467. A very common plant on sandy places near the ocean. The plants grow in great mats covering the sand. Only before collected by Mr. C. R. Orcutt in northern Lower California and by Mr. Brandegee at Magdalena Island and San Gregoria. Dr. Palmer has collected a large quantity of this plant.
765. *Erodium Texanum* Gray. Common on gravelly hills.
818. *Fagonia Californica* Benth. Grows among rocks in a cañon 30 miles inland.
827. The same. But three plants found on the hills near the beach.
829. *Phaseolus filiformis* Benth. Very common on the sand hills near the beach.
797. *Lupinus Arizonicus* Watson. Common on the sand plains back of the beach. Some flowers are white, others are drab-colored.
790. *Calliandra Californica* Benth.
776. *Astragalus triflorus* Gray. Very abundant near the beach.
791. *Hosackia glabra* Torr. A very common plant 40 miles inland, grows compact.
777. *Hosackia maritima* Nutt. Sandy, level places, 15 miles from the sea; bloom yellow.
820. *Hosackia rigida* Benth. Stems flexuose, much branched at base; leaves sessile, with small leaflets. Peduncles long (2 to 4 inches). Pods almost terete, $1\frac{1}{2}$ to 2 inches long. Found in a cañon 30 miles inland. The plant most resembles Palmer's (175), 1876, from Arizona.
813. *H. Bryantii* Brandegee. Proc. Cal. Acad., 2d. ser. II, 144.
769. *Oenothera crassifolia* Greene. Bull. Cal. Acad., I. 156. Stems annual or biennial, glabrous and very glaucous; leaves linear or narrowly lanceolate, entire or sinuately toothed. Capsule linear, much contorted. We have not seen Mr. Greene's type, but the plant does not seem to be the same as Orcutt's specimens. Very common on the sand hills and depressions near the beach. "Showy colored flowers," more or less purplish on drying.
772. *Oenothera septrostigma* Brandg. Proc. Cal. Acad., 2nd. ser. II, 156. Sandy plains; 10 miles inland. Part of type.
771. *Oenothera angelorum* Watson. Proc. Amer. Acad., XXIV. 49. Forty miles inland.
768. *Filago Arizonica* Gray.
773. *Viguiera Purissimae* Brandigee. 2d. ser. II. 173.
- Franseria dumosa* Nutt. This is the same as Palmer's 559 (from Los Angeles Bay, 1887). The leaves are much more coarsely cut, and the spines hardly flattened and hooked at tip. A compact plant 2 feet high, abundant on the hills near the sea.
770. *Franseria Bryantii* Curran.

793. *Vigulera laciniata* Gray. Three to four feet high. In stony ravines 30 miles back from the ocean, and there common.
826. *Helianthus dealbatus* Gray. Clearly an annual; quite common on the sand hill near the beach, growing thickly together. This is the most southern station of this species. Besides the station given in Syn. Flora, is to be added Orcutt's Locovrs (1886) plant; also at Ensenada and recently Santa Margarita Island, by Mr. Brandegee. For this species Mr. Brandegee takes up Bentham's old specific name of *Encelia nivea* and writes *H. niveus*.
822. *Encelia frutescens* Gray. Common on the hills 40 miles back from the ocean; 3 to 4 feet high.
828. *Encelia Ventrorum* Brandegee. Proc. Cal. Acad., 2d. ser. ii, 175.
795. *Leptosyne parthenioides* Gray. Var. *dissecta*, Wat. Proc. Am. Acad., xxiv, 36. Dr. Palmer says this plant has a wide range on the sandy plains and hills. Seen 40 miles back from the ocean; bloom at first white, but soon becoming purplish. The margin of the akenes are incurved in age, with no pappus, muriculate on the back. The only other collection of the species, that we know of, is that of Palmer at Los Angeles Bay. This plant Dr. Watson took to be the *Acoma dissecta* of Benth., but the rediscovery of that species by Mr. Brandegee the past season shows that they are not the same. Therefore Palmer's Los Angeles plant is the type of *L. parthenioides* var. *dissecta* Watson, and is not to be confounded with *L. dissecta* Gray.
787. *Amblyopappus pusillus* H. & A. Very abundant on hills.
782. *Eriophyllum lanosum* Gray.
778. *Chaenactis lacera* Greene. Pitt., V, 29. This species was first collected by Lieutenant Pond, at San Bartholome Bay, in March, 1889. Dr. Palmer collected it about the same time in considerable quantity. It grows in low sandy places near the ocean. Said to be a very fleshy plant. The stems and leaves purplish. "Bloom white" or turned by age to rose.
786. *Dysodia anthemidifolia* Benth. First collected by the Sulphur, also Dr. Streets, recently by Lieutenant Pond, at San Bartholome Bay, and Brandegee. Very common on the sandy plains, near the sea-beach, and extending for miles back from the ocean. Dr. Palmer says it is a showy plant for cultivation, with bright amber-colored flowers and an odor like the African Marigold.
817. *Malacothrix Californica* D. C. Flowers "showy, yellowish white." Outer pappus three to four persistent bristles. Sometimes with branching scapes. Lemmon also collected such a form in 1875. So far as we know this species has not before been found out of California. Dr. Palmer reports it very common in the sand-hills about the bay.
814. *Philbertia linearis* Gray. A small trailing plant about 3 feet long, twining about bushes or prostrate on the ground, often rooting at the nodes. The older stems develop a very thick corky bark. The whole plant is glabrous, except the inflorescence, which is very pubescent. The flowers are "canary white."
774. *Gilia Jonesii* Gray. Only a few plants seen and these all collected in the hilly country, 40 miles from the ocean. This species is only known from Jones's specimen from the Needles, southeast California (1884). We have not yet seen the type, but the species certainly goes into the section *Linanthus*, and there is nothing in Gray's meager description to keep it out of *G. Jonesii*.
780. *Krynitzkia intermedia* Gray. A very common plant 25 miles from the ocean.
781. *Krynitzkia maritima* Greene. The nutlets often of two kinds, both maturing. The glabrous nutlets acute on the edge. The leaves often broader at the base.
829. *Rumex hymenosepalus* Torr. Called "Yerba Colorado." Much used as a medicine, especially in venereal diseases, flesh wounds, etc. The young tops sometimes used as greens in California.

- 788.* *Argythamnia serrata* Muhl. Var. *Magdalenæ*, Millsp. Proc. Cal. Acad. 2d. ser., ii, 221. Found in sandy places between the hills contiguous to seabeach; has very long roots.
785. *Stillingia linearifolia* Watson. Grows in the hollows between hills near the sea beach among shrubs and plants, loose grower.
783. *Euphorbia polycarpa* Benth., var. *vestita* Watson. Hills 40 miles back from the ocean. Plants quite scattering.
789. *Euphorbia Pondii* Millspangh, sp. nov. Annual, prostrate, spreading from the base. Stems glabrous, (3 to 6 centimeters long), dichotomously branching. Leaves ovate, obtuse, entire, ($1\frac{1}{2}$ to 3 millimeters long, 1 to 2 millimeters broad); petioles hairy, (one-fourth to three-fourths the length of the blade); stipules large, bluntly triangular, margined with two to four fascicles of ciliae. Inflorescence solitary in the upper axils, and terminal upon the youngest branchlets; involucre turbinate, sessile, slightly hairy; glands four, transversely ovate, minute, dark red; appendages minute, white, orbicular, deeply two crenate-toothed on the margin, or wanting; styles bifurcate to the middle. Capsule trisulcate; carpels carinate and slightly tuberculate; seeds elongated, quadrangular, ferruginous between the angles. Described from a specimen collected at Plaza Maria, Lower California, in 1889, by Lieut. Chas. F. Pond, U. S. Navy; also Gaudalupe Island by Palmer. A form with smooth capsules and more turgid seeds is in this collection. Hills 40 miles back from sea beach, the plants have a yellow shading when fresh.
792. *Euphorbia Xanti* Engl. Typical specimens of both sorts, the white and the red appendiculate, that prove the shrubbiness of the species. Abundant, 25 to 40 miles back from the ocean; loose grower, pinkish-white flowers. Sometimes old plants are met with that have deep, rose-colored flowers.
775. *Chorizanthe Vaseyi* Parry & Rose. Bot. Gaz., XV, 64. A figure of this plant accompanies the description. Among hills, 40 miles inland.
779. *Allium Californicum* Rose, n. sp. Bulbs caespitose, narrowly oblong with dark red coats, deep seated (3 to 4 inches), scapes terete, 3 to 5 inches high: leaves three to five, linear, mostly shorter than the scape: spathe two-valved and these ovate, acute: umbel somewhat open, four to five rays: pedicels 5 to 8 lines long: flowers "dark mauve color," with lanceolate-acuminate segments: stamens and style included: capsule obtuse, with two ovules in a cell, but one (rarely two) of the ovules mature.
- A species closely related to *A. hematochiton*, Wat. Hilly country 40 miles back from the ocean; "Grows in stiff clay; odor strong of onions."
654. *Aristida Californica* Thurb. This peculiar grass grows in small, compact bunches. It has a wide range on sandy soil and gravelly hills. It is the only grass in this section which affords forage for wild or domestic animals, and as it is generally found (as shown by many of these specimens) denuded of its leaves, while the flowers and seed-tops remain intact, the inference would be that wild animals (domestic animals are few here) crop the leaves while the grass is tender.
655. *Festuea tenella* Willd. Var. (very small.) A common grass, especially where water is retained in sandy arroyos and plains. Seldom found with the appearance of having been cropped by animals.
651. *Aristida bromoides* H. B. K. Common on sandy slopes and places where moisture is retained, growing so thickly that they seem sown for a lawn.
652. *Triodia pulchella* H. B. K. Found in tufts on a gravelly ridge.
653. *Muhlenbergia debilis* Trin. These, the only ones found, were associated with 651.

* *Euphorbiaceæ* determined by C. F. Millspangh.

CEDROS ISLAND PLANTS.

Dr. Palmer spent three days on the north end of this island, March 18 to 20, and made a large and valuable collection. His numbers run from 677 to 764, and unfortunately are partly duplicated in the San Quentin collection of the same year.

Mr. Greene has published (Pittonia, vol. 1, 200-208) a list of the known species of this island, and also a supplement (*l. c.* 266-269) listing ninety-one species. Dr. Palmer has added at this time forty-three species to the flora of the island. Dr. Streets, who visited this island in 1876, and made a small collection, found here *Abutilon Lemmoni*, which has not been since rediscovered. Mr. Belding has also collected here, but not very extensively. The species now known to the island are one hundred and thirty-five.

For convenience we give here all the species not given in Mr. Greene's list, and we also add in parenthesis, his number after species found in his list:

Draba Sonoræ Greene.

Lepidium Menziesii D. C.

Arabis pectinata Greene.

Thysanocarpus sp.

Polycarpon depressum Nutt.

Zizyphus Parryi Torr.

Abutilon Lemmoni Wats.

Lupinus sp.

Hosackia maritima Nutt.

Phaseolus filiformis Benth.

Astragalus sp.

Tillæa sp.

Mentzelia adherens Benth.

Apiastrum angustifolium Nutt.

Filago Arizona Gray.

Gnaphalium Sprengelii H. & A.

Perityle Grayi.

Encelia Cedrosensis Rose, n. sp.

Amblyopappus pusillus H. & A.

Senecio sylvaticus Linn.

Rafinesquia Californica Nutt.

Microseris linearifolia Gr.

Sonchus tenerrimus Linn.

Sonchus oleraceus Linn.

Ellisia chrysanthemifolia Benth.

Phacelia Cedrocensis Rose.

Pectocarya linearis D. C.

Plaggybothrys Cooperi Gray.

Nicotiana Greeneana Rose.

Antirrhinum Watsoni Vasey & Rose.

Antirrhinum subsessile Gray.

Parietaria debilis Forst.

Pterostegia drymarioides F. & M.

Atriplex, n. sp.

Atriplex microcarpa Dietr.

Aphanisma blitoides Nutt.

Ephedra sp.

Trisetum barbatum Steud.

Melica imperfecta Trin.

Stipa eminens Cav.

Muhlenbergia debilis Willd. var.

Festuca tenella Willd.

Agrostis verticillata Trin.

Cheilanthes Brandegei Eaton.

723. *Draba Sonoræ* Green. Only one plant seen on the side of a cañon. Not before found on the island.

726. *Sisymbrium canescens* Nutt. Only one small plant seen in a cañon. Mr. Greene found only a single specimen. (No. 2 of Mr. Greene.)

709. *Lepidium Menziesii* D. C. In exposed places. Not before reported from here.

717. *Arabis pectinata* Greene. Pitt., 1,287. Recently described by Mr. Greene from specimens from San Bartholome Bay, Lower California. Somewhat common but scattering.

686. *Thysanocarpus* sp. Smooth and a little glaucous, 3 to 12 inches high: leaves 5 to 10 lines long, ovate to narrowly lanceolate, entire or toothed, auricled at base: flowers rose-colored: sepals less than one-half line long: petals of same length as sepals, spatulate, obtuse: two of the stamens united, style wanting: pods oval, 2 lines in diameter, smooth or pubescent, the wings thin, not nerved, purple, emarginate at both ends.

Only a few plants found and these on a level place. First described and distributed as *T. Palmeri*, but since Mr. Watson has written that it is probably his "*T. erectus* described from miserable material."

747. *Isomeris arborea* Nutt. Plants about 4 feet high. (No. 3 of Mr. Greene.) Also collected by Lieutenant Pond this season. Mr. Greene considered that this species belongs to *Cleome* and calls it *C. isomeris*, Pitt. i, 200.
699. *Frankenia Palmeri* Watson. Common plant near the sea-beach. (No. 5 of Mr. Greene.)
713. *Polycarpon depressum* Nutt. Collected only by Nuttall and Lemmon, in southern California, although various things have been distributed as this species, even *Tillea minima* and *Achyrocnichia Cooperi*. Found under pine trees at the highest point on the north end. (Altitude, 1,761 feet.)
699. *Sphaeralcea** *fulva* Greene. Pitt. i, 201. Only three specimens found and these in flower. Collected by Dr. Streets in 1876. (No. 6 of Mr. Greene.)
752. *Ziziphus Parryi* Torr. *vide* Trelease. The following is Dr. Palmer's note. "A very thorny shrub, 2 to 3 feet high, with numerous crooked branches, forming a compact plant, good for a hedge. The fruit when ripe may be yellow, as that color was indicated in some of the fruit seen." In cañons and mountain sides apparently not collected before.
733. *Rhamnus crocea* Nutt. "The more acute leaved sharply toothed form," Trelease in lit. An upright growing shrub 6 to 8 feet high. In cañons. (Probably No. 7 of Mr. Greene.)
730. *Rhus Lentii* Kell. Proc. Cal. Acad., ii, 16. A large shrub 5 to 6 feet high in cañons. "A profuse bloomer; crimson colored to white; fruit shiny, as if iced over." Fruit a half inch long. (No. 9 of Mr. Greene.) Also collected by Lieutenant Pond this season. By Dr. Veatch, in 1859.
735. *Rhus integrifolia* B. & H. Dr. Palmer says of this plant, "An irregular growing shrub, with short body and stiff limbs." Much used by the fishermen for fuel, for which it is very good. In cañons. (No. 10 of Mr. Greene.)
682. *Veatchia Cedrosensis* Gray. Dr. Palmer's notes are as follows: Not found in bloom or fruit. A dwarf tree 5 to 6 feet high, dotted here and there over the north end of the island. The wood is soft and spongy, shrinking when cut, leaving little but the bark. Mr. Brandegee has identified this plant with the *Schinus discolor* Benth. Bot. Sulph., p. 11, and has collected it from the original station (Magdalena Bay.) In Proc. Cal. Acad., 2d ser., 2, 140, he considers it a good *Veatchia* and taking up the oldest specific name, writes it *Veatchia discolor*. He also refers here *Bursera pubescens* Watson. (No. 8 of Mr. Greene.)
721. *Lupinus* sp. This is the same as our 666a (distributed as 708) of former paper. The plants are often smaller, the flowers larger (5 lines long), scattered or somewhat verticillate; the bracts tardily deciduous; pods four to six seeded. Found on hill sides and cañons. A very showy plant "bloom purple upper lobes yellow." As we noted before, our plant seems nearest *L. Arizona*, but it hardly answers for that and perhaps should be made distinct.
736. *Hosackia maritima* Nutt. The flowers are only 2 lines long; the pods few seeded. This is the same as the San Quentin 669a. Not before found on the island.
698. *Hosackia nudata* (Greene). We have not seen Mr. Greene's type, and yet there is little doubt but that this is his *Syrmatium*. Our plant is larger, with many slender weak branches; the leaflets sometimes larger ($3\frac{1}{2}$ lines long), often obtuse, glabrate in age. Although many of the short peduncles bear but one to two flowers, yet it is not uncommon to find three, four, and sometimes five flowers in the umbel. The species of *Syrmatium* form a strongly marked

* Another of the *Malvaceae* belonging to the island not reported by Mr. Greene or found by Dr. Palmer, is *Abutilon Lemmonii*, collected by Dr. Streets in 1876.

section of *Hosackia*, and it is an open question whether it should not be kept distinct. Mr. Greene (in vol. ii, Bull. Cal. Acad.) thinks it should be, and ably defends Vogel's genus. Mr. Watson, while saying it might well be considered generically distinct, still retains it under *Hosackia*, and the same course is followed by Mr. Brandegee in his recent paper. The discovery of a number of species belonging to this in late years would seem to emphasize the independence of the section. If it is so to be considered, the two recent species of the authors (published in Proc. Nat. Museum, vol. xi, pp. 528, 529) should be referred to as *S. Watsoni* and *S. Palmeri*. However, in the present uncertain limitations of the genus, we accept the limits of Bentham and Hooker in Gen. Plant, followed by Mr. Watson, in Botany of California.

- 733. *Phaseolus filiformis* Benth.** Bot. of Sulphur, p. 13. This was collected in 1875 by Dr. Streets, and this season by Lieutenant Pond. Found in exposed places facing the ocean; "Bloom, white." The plant has been collected near the United States boundary by Orcutt in northern Lower California; also at Carmen Island (Palmer, 1875); Guaymas, Mexico, Palmer, 1887; Xantus, 1859, and by Brandegee, in Lower California.
- 727.** The same; mouth of cañon; "bloom rose-colored."
- 744. *Dalea Benthani* Brandg.** Proc. Cal. Acad. 2nd ser. ii, 148. As already pointed out by Mr. Greene this plant differs from the *D. megacarpa* in its persistent stipular spines, the spikes are shorter and not so close, the terminal leaflet retuse; "bloom, yellow." A compact plant one foot high. (No. 16 of Mr. Greene.) Collected by Lieutenant Pond, 1859, and distributed by Mr. Greene as var. *biuncifera* Greene, and also in this collection.
- 683. *Astragalus fastidiosus* Greene.** Bull. Cal. Acad., I, 186. Common in cañons in moist places; bloom "carmine-yellow." Mr. Watson writes, "one good character has not been noted, the articulation of the pod on the stipe, which also occurs in one or two other species." (No. 12 of Mr. Greene.)
- 685. *Astragalus insularis* Kell.** Bull. Cal. Acad., I, 6. Before known only from the specimens collected by Dr. Veatch in 1859, the species not being described until 1877. Only a few specimens were obtained at this time, mostly in fruit. It is to be regretted that a larger collection had not been made of this rare and little known species. It grows in exposed places near the sea. (No. 13 of Mr. Greene's list, but not found by him.)
- 692. *Astragalus* sp.** Annual; much branched and spreading at base, more or less pubescent; branches slender: leaflets seven to eleven, 1 to 2 lines long, retuse or sometimes linear, acute, and 3 lines long: flowers, one to three, minute, (less than 2 lines long): peduncles 10 to 20 lines long: pods 3 to 5 lines long, slightly pubescent; the dorsal suture intruded, except near the apex; one-celled, incurved and reticulated. We have distributed this as *A. Cedro-censis*, but Mr. Watson thinks it is *A. Nuttallianus*, D. C., but pods always one-celled, etc. Growing on level places facing the sea. "Bloom pale-blue."
- 708. *Tillæa leptopetala*, Benth.*** It seems to us that this species should be separated from *Tillæa minima*. It is probably *T. leptopetala* of Bentham, but the

* Collected also by Palmer at Guadalupe Island. "Among plants in cañons. The specimens are very red." (No. 900.) The typical form of *Tillæa minima* Miers was collected by Dr. Palmer, at San Quentin, in February, 1889, and distributed as No. 713 in part, and No. 714. A third species of *Tillæa* proper, *T. connata* Ruiz et Pav. Fl. Per. and Chil. I, 70, is to be added to our North American flora. The plants are larger than *T. minima* and not diffusely branched. The sepals almost a line long, ovate acuminate; the petals almost filiform. Collected also by Dr. Palmer at San Quentin (713a), growing with *T. minima*. Our plant seems to be the same as the one collected under the United States exploring expedition of Captain Wilkes, in Peru, and referred here by Dr. Gray, page 688. He considered it distinct from *T. rubescens* H. B. K., but if the same it must still give place to *T. connata*, the older name.

stems are quite red, while Bentham says of this species "specimina haud rubescent," and was collected near the San Francisco Bay. The stems are mostly single and erect, or sometimes with a few branches; flowers glomerate in the axils of the connate leaves, nearly sessile; the sepals narrower and more acute; seeds always two in each carpel. Shady spots in cañons.

- 753. *Eucnide cordata*** Kell. Curran, Bull. Cal. Acad., I, 137. A loose growing plant about 4 feet high; "bloom yellowish-white." At mouth of cañon. Collected by Dr. Veatch in 1859. (This is Mr. Greene's No. 20); he considers it a *Mentzelia*, to which genus Kellogg first referred it. Mr. Watson thinks, however, that the two genera should be kept separate.
- 751. *Petalonyx linearis*** Greene. Bull. Cal. Acad., I, 188. Found in a ravine, apparently common. About 2 feet high; "bloom white." (No. 21 of Mr. Greene.)
- 712. *Mentzelia adherens*** Benth. Both of Sulphur, p. 15. This plant differs somewhat from Palmer's 1887 plant, referred to this species by Mr. Watson. The sepals are larger, their margins involute in age and rigid. Capsule not angled, of a different texture; the seeds are grayish and much wrinkled. Not given in Mr. Greene's list, but collected by Dr. Streets in 1876. "Bloom canary color." In exposed places.
- 719. *Echinopepon minima*** Wat. Proc. Amer., Acad. XXIV, 52. Stems glabrous slender, 4 to 5 feet long, climbing over small bushes: leaves thin, smooth below, white-papillose and scabrous above, triangular-cordate, more or less three-lobed, 1 to 1½ inches long. Sterile racemes (including peduncle) 3 to 4 inches long: limb of the flower 4 lines broad, peduncle 6 lines long: fertile flowers mostly solitary, the peduncle becoming 8 to 9 lines long, fruit 6 to 9 lines long (not including the beak), echinate with spine-like processes, two celled, dehiscing by a deciduous operculum: cells three to six seeded, 1½ lines long, compressed, dark-colored.
- By a slip of the pen Mr. Watson has reversed the character of the surface of the leaf, and Mr. Cogneaux has copied the mistake into his monograph. Vol. III, 805. At the mouth of a cañon. Mr. Watson in Torrey Bull., vol. XIV, has re-established Naudin's genus, separating it from *Echinocystis* into which B. & H. had thrown it, followed by Cogneaux, in *Monographie Phanerogamarum*, vol. III. Our plant is the same as Dr. Streets, from Cedros island (1866).
- 693. *Mamillaria Goodridgii*** Scheer. Our specimen is doubtfully referred to this species.
- 679. *Apiastrum angustifolium*** Nutt. Growing in shady cañons. Not before reported from here, and the only known Umbellifer on the island.
- 689. *Bigelovia veneta*** Gray. Only a few plants collected. The whole plant very glutinous. (No. 34 of Mr. Greene.)
- 705. *Filago Arizonica*** Gray. Side of cañon in moist shade. Not before found here.
- 750. *Gnaphalium Sprengelii*** H. & A. A few specimens found in a deep cañon. Not before reported from here.
- 731. *Franseria chenopodifolia*** Benth. Very common. (No. 36 of Mr. Greene.)
- 757. *Franseria camphorata*** Green, var. *leptophylla*, Gray. Proc. Amer. Acad., XXII, 309. Very common; a foot or so high. No 37 of Mr. Greene. The variety also collected near San Fernando, Lower California, by Orcutt, (1886). First collected on Guadalupe Island.
- 743. *Viguiera lanata*** Gray. Very common plant on the island, and a large quantity collected in full bloom. Collected by Veatch, Streets, Belding, and Greene (No. 42.)

- 741. *Encelia Cedrosensis*** Rose n. sp. Shrubby, 4 feet high, somewhat scabrous throughout: leaves opposite, sometimes alternate above, shining, ovate-lanceolate, entire or repandly, toothed, 2 to 3 inches long, on short, slightly winged petioles: heads (6 lines high) numerous, corymbose: involucre bracts short and broad, the inner ones acutish, hirsute on the margins, rays small and narrow, mostly shorter than the disk flowers: akenes 2 to $2\frac{1}{2}$ lines long, broadly obovate, hirsute, with two long slender persistent awns, over 3 lines long. In cañons.
- 702. *Encelia Californica*** Nutt. Form, *vide* S. Watson. Very shrubby below, a compact plant about 2 feet high. Grows in exposed places. Collected by Dr. Streets in 1875, but only in flower. Dr. Pond has collected the same on the south end of the island, which Mr. Greene considers *E. conspersa*, Benth. Mr. Brandegee has recently collected at the original station (Magdalena Bay) what he considers Bentham's plant. We have not seen his specimens. (87 of Mr. Greene.)
- 734. *Encelia stenophylla*** Greene. Bull. Torr. Club. x, 41. Very common.
- 701. *Perityle Greenei*** Rose, Bot. Gaz., XV, 117.
- 701. *P. Grayi*** Rose, Bot. Gaz., XV, 118.
- 700. *Eriophyllum confertiflorum*** Gray. Common on most elevated places among shrubs. (No. 46 of Mr. Greene.)
- 687. *Amplyopappus pusillus*** H. & A. Not before reported from here, but apparently common.
- 697. *Porophyllum gracile*** Benth. Small and compact. Found at the mouth of a cañon. Has the strong aroma of the cultivated rue. (No. 45 of Mr. Greene.) Collected also by Lieutenant Pond this year.
- 696. *Bebbia juncea*** Greene. Common in cañons (No. 39 of Mr. Greene.)
- 724. *Senecio sylvaticus*** Linn. Only two small plants seen on mountain slope near the base. Not before found on the island.
- 678. *Senecio Cedrosensis*** Greene. Bull. Cal. Acad., I, 194. Rather compact growing plant with small green leaves, and sulphur-colored flowers; a good bloomer; grows in elevated places and cañons. Not before found in flower; rays 8, small; akenes puberulent. (No. 47 of Mr. Greene.)
- 694. *Trixis angustifolia*** D. C. Rather common. (No. 48 of Mr. Greene.)
- 760. *Rafinesquia Californica*** Nutt. Not common; in cañons among other plants. Not before found here.
- 761. *Microseris linearifolia*** Gray. In cañons in shade of bushes.
- 762. *Malacothrix Clevelandi*** Gray. Dr. Palmer reports this species common in cañons among rocks and bushes. Mr. Greene only found a few plants in 1885. (No. 50.)
- 759. *Sonchus tenerrimus*** Linn. Shady side of cañons and under bushes. More common than the next.
- 759. *S. oleaceus*** Linn., in part. With the last.
- 718. *Gilia Veatchii*** Parry. Bull. Cal. Acad., I, 198. Very common. Collected by Dr. Veatch, in 1859, (No. 53 of Mr. Greene.) Dr. Palmer says flowers "yellowish white".
- 716. *Ellisia chrysanthemifolia*** Benth. A few specimens collected; flowers white. New to the island.
- 758. *Phacelia ixodes*** Kellogg. Perennial, but sometimes blooming the first year. Three feet or so high, very viscid, glandular: the lower leaves 6 to 10 inches long, the inflorescence a scorpioid panicle: corolla open: the stamens and style exerted: the capsule sometimes as long as the calyx.
- Collected at the very summit of the north end, but also in cañons below. "Bloom lilac color." Collected by Dr. Veatch; (No. 55 of Mr. Greene.)

The Cedros Island plant differs from Orcutt's All Saints' Bay plant of the Syn. Flora, and Palmer's Coronados Island plant. The plant is smaller, less viscid; the corolla smaller, less open, the style and stamens included, the capsule shorter than the calyx, the appendages large, somewhat reflexed. Palmer's Coronados Island plant grows along the beach under the influence of the sea water. And Mr. Orcutt writes that the same is true of his plant.

- 715. *Phacelia (Eutoca) Cedrosensis*** Rose n. sp. Very hispid with slender bristles, also a little viscid in the inflorescence: stems 1 to 6 inches high, simple or somewhat branched: leaves pinnate, the segments entire or few toothed, inflorescence somewhat crowded, mostly geminate: flowers almost sessile: calyx parted almost to the base, its lobes linear or oblanceolate, 3 lines long, delicately three-nerved: corolla bluish, campanulate, about the length of the sepals: stamens barely exerted; appendages long and narrow, united to the stamens at base: style cleft for one-third its length; capsule one and one-half lines long, obtuse: seeds twelve to eighteen. Seemingly nearest *P. hirtuosa* of Lower California. Found in the shade of bushes in cañons. Not very common. A species peculiar in its dense bristles.
- 691. *Krynitzkia maritima*** Greene. Stems very much branched.
- 690.** The same with longer narrowly-lanceolate leaves, much resembling the *K. ramosissima* of Palmer's, Los Angeles Bay, 1887. Always one glabrous nutlet, with one or all the others maturing, but different, as described by us in a former paper.
- 722. *Pectocarya linearis*** D. C. A single specimen found under pines at the summit of the highest peak (1,761 feet), north end. New to the island. The nutlets differ somewhat from most specimens seen, but much resemble *P. linearis*, var. of Lemmon (1884), Arizona.
- 711. *Plagybothrys Cooperi*** Gray. A few plants found on the highest point of the island. The stipe to the nutlet, only about half as long as in our San Quentin plant. New to the island.
- 745. *Physalis Greenei***. Only one small plant found. This is very close to Palmer's 682, from San Quentin, and the close resemblance of the latter to Dr. Streets's Cedros Island plant, we pointed out in our former paper. Proc. U. S. Nat. Mus., vol. XI, 533. *P. pedunculata* Greene non Mart. et Gal. The San Quentin plant Mr. Greene writes is his *P. muriculata*.
- 740. *Lycium Cedrosensis*** Greene? A few sterile branches.
- 732. *Nicotiana Greeneana*** Rose n. sp. Somewhat viscid, pubescent, 4 to 9 inches high, simple or little branched at base: lower leaves oblong to lanceolate, 1 to 2 inches long, petioled: the upper ones linear: calyx lobes unequal, the longer about the length of the tube: corolla yellowish white, 5 to 8 lines long, a little constricted at the orifice, its limb 2 to 3 lines broad: the stamens equally inserted low down in the tube: capsule four-valved, longer than the calyx tube. This species seems nearest *N. Clevelandi* in its leaves and calyx, but the corolla is more like *N. trigonophylla*. It seems quite distinct from either. Not very common. Dr. Palmer says in his note respecting this plant, "All the plants seen were taken; not very sticky, nor had the plants but a faint odor like that accompanying the handling of tobacco."
- 714. *Antirrhinum Watsoni*** Vasey & Rose. A small form, 3 to 8 inches high with linear leaves, "corolla purple." Very rare. At the north end in the shade of bushes in ravines. Not before collected on the island. Mr. Brandegee, in his paper on the "Plants of Baja, California" gives two additional stations, viz: Magdalena and Santa Margareta Islands. The species is doubtless common and of a wide range.
- 725. *Antirrhinum subsessile*** Gray? Only three small plants found in the shade; 2 to 8 inches high. In fruit, no flowers. At least new to the island.

720. *Galvesia juncea* Gray. Collected by Dr. Streets in 1875 (No. 56 of Mr. Greene); Lieutenant Pond (1889). Grows in large bushes 5 feet high. Described in Syn. Flora as being only 2 feet high.
681. *Mimulus cardinalis* Dougl. Hort. Trans. xi, 70. Only a single specimen collected. (No. 56 of Mr. Greene.)
- 739a. *Pentstemon cedrosensis* Kellogg. Proc. Cal. Acad. xi, 19. Collected by Dr. Veatch in 1859, and the flowers described as yellow. Mr. S. Belding obtained it here in 1881, and Dr. Gray described it as *P. brevibris* with a white (?) corolla. In dried specimens the corollas have a yellow or deep orange color. Dr. Palmer's field-note says, "bloom scarlet; very showy," very common in cañons near the ocean. (No. 55 of Mr. Greene's list.)
728. *Mimulus glutinosus* Wendl. Only three plants seen; flowers only 1 inch long; "bloom amber color." Mr. Greene thinks this plant is distinct from those of the mainland. Collected by Dr. Veatch in 1859. (No. 57 of Mr. Greene.)
677. *Verbena lilacina* Greene. Bull. Cal. Acad., I, 212. Ravines; "rather showy plant, abundant bloomer of a lilac color and very fragrant." Collected first by Mr. Greene, 1885. (No. 62.)
684. *Salvia cedrosensis* Greene. Bull. Cal. Acad., I, 212. Common plant on the island. A mere fragment was collected by Dr. Veatch. (No. 61 of Greene.) Only known to the island.
746. *Teucrium glandulosum* Kell. Proc. Cal. Acad., II, 23. First collected by Dr. Veatch in 1859. (No. 60 of Mr. Greene.) Common in deep shady cañon. "Flowers white with pink shading." Only known from the island.
680. *Parietaria debilis* Forster. Among rocks and bushes in cañons.
703. *Eriogonum fasciculatum* Benth. *Ide* Watson. The same as 729 from San Quentin, of former paper.
706. *Eriogonum Pondii* Greene. Pitt I, 267. Compact plant about a foot high in exposed situations. (No. 85 of Mr. Greene's list.) Collected by Lieutenant Pond, 1889.
710. *Pterostegia drymarioides* Fieh & Mey. Grows among bushes and rocks in shade. It seems not to have been collected before on the island.
704. *Harfordia fruticosa* Greene. Parry in Proc. Acad. Davenport, V., 28. This species, before little known, has now been collected in great abundance, both in flower and in fruit. The perianth is six parted and stamens nine in two rows. The flowers seem to be perfect and not dioecious. This is one of the most common shrubs of the island, growing in cañons and exposed places; 3 feet high. Collected by Dr. Veatch. (Mr. Greene's No. 63.) Lieutenant Pond, 1889.
737. *Mirabilis Californica* Gray. Collected by Dr. Streets in 1876. (No. 65 of Mr. Greene.)
754. *Atriplex*. n. sp. Dioecious, perennial and woody at base, 1 to 2 feet long, erect or ascending, glabrous and densely glaucous, becoming a little scurfy in age: leaves small (6 to 12 lines long) broadly ovate to oblong, tapering at base into a short petiole, abruptly acute at apex: bracts small ($1\frac{1}{2}$ lines wide by 1 line high) somewhat compressed, cuneate at base, scarcely marginal with a few small teeth above, sometimes a little mucronate on the sides: sterile flowers densely glomerate, five parted. Grows in abundance near the beach. Perhaps nearest *A. dilata*, Greene, but smaller fruit, leaves, etc.
745. *Atriplex microcarpa* Dietrich.
742. *Aphanisma blitoides* Nutt. This plant has been collected this season, also at San Quentin, San Benito Island, Guadalupe Island. Not before found on this island.
756. *Chenopodium murale* Linn. (No. 83 of Mr. Greene.) Only a few specimens collected.

729. *Simmondsia Californica* Nutt. This is *S. fabulosa* of Kellogg, referred here by S. Watson, but without seeing specimens. It is only known from Dr. Veatch's collection and was not rediscovered by Mr. Greene. Dr. Palmer speaks of it as a large shrub at mouth of cañons.
676. *Juncus robustus* Wat.
764. *Juniperus Cerrosianus* Kellogg. "An irregular shrub, 3 to 6 feet high, on various parts of the north end, but of no particular use."
763. *Pinus muricata* Don. This plant grows on the highest peak 1,761 feet altitude.
695. *Ephedra* sp. It may be new. Not common; mouth of cañon.
748. *Notholæna candida* Hook. Grows in deep cañons in shade of rocks. (No. 82 of Mr. Greene.)
749. *Pellæa andromedæfolia* Fee. Common in cañons. (No. 81 of Mr. Greene.)
707. *Cheilanthes Brandegei* Eaton n. sp. ined.
659. *Trisetum barbatum* Steud. Often looks as if sown. Found upon the highest points of the island, on the slopes of shady ravines, and under bushes.
660. *Melica imperfecta* Trin. Found, not abundantly, upon hill-sides and ravines, growing more thriftily near small shrubs and among rocks, as if seeking shade or moisture.
661. *Stipa eminens* Car. Grows in large bunches on the lower part of slopes and ravines. A coarse grass, with the dead grass of last year still clinging to the bunches.
662. *Melica imperfecta* Trin. Found in one place only, in a deep cañon near a spring.
663. *Muhlenbergia debilis* Willd. var. Common at the mouth of cañons in exposed positions.
664. *Festuca tenella* Willd. var. Very abundant; growing in large patches, as if sown, upon the highest point of the island, and sparsely in the shade of plants and bushes.
665. *Festuca tenella* Willd. var.
666. *Agrostis verticillata* Trin. Found one plot 3 feet square on a wet place of what is known as the watering place of the island.

SAN BENITO ISLAND PLANTS.

Mr. E. L. Greene has very recently published (*Pittonia*, vol. 1, pp. 261-266) a very interesting little paper on the vegetation of the San Benito Islands with a list of the known plants. He has enumerated twenty-four species as belonging to the largest islet. His plants were collected by Lieut. Charles F. Pond at various times from December to February. Dr. Edward Palmer spent but a day (March 25) on West San Benito. His general notes of the island and its vegetation are very similar to Mr. Greene's, and need not be repeated here. He collected seventeen species, all of which are given in Mr. Greene's list. He has, however, collected some of the varieties in considerable abundance. He speaks, also, of two forms of *Agave*, neither in flower or fruit. No specimens were sent in, and nothing is known as to the species. If these should prove two distinct species, of course it will increase the number of species to twenty-six. We have included for convenience in a parenthesis, Mr. Greene's number.

909. *Eschscholtzia ramosa* Greene. Bull. Torr. Club, XIII, 217. This plant was collected in 1876 on these islands by Dr. Streets. (No. 1 of Mr. Greene.)
908. *Frankenia Palmeri* Watson. Abundant, especially on level places; a foot to 18 inches high; flowers white to pink. (No. 4 of Mr. Greene.)

917. *Lavatera venosa* Watson. Proc. Am. Acad., XII, 249. Poor specimens were collected by Dr. Streets in 1875. Not since collected until obtained by Lieutenant Pond. Dr. Palmer says of it: "The plant that leads in numbers all others on the island. Its bright green gives the island rather a fertile look. It is on all the level places in the arroyos and deepest cañons and reaches to the summit. A beautiful plant with white and purple flowers, much darker at night, 1 to 3 feet high. The petals are at first straight, and then turn under as they take on the purple color. A fine plant for cultivation in green-houses and gardens of warmer latitudes." Dr. Palmer has collected it in great abundance, and has obtained a good supply of seed. (No. 3 of Mr. Greene.)
913. *Hosackia maritima* Nutt. But a few specimens collected. The pods are three to nine seeded. (No. 3 of Mr. Greene.)
922. *Cotyledon linearis* Greene. Pitt., I, 285. Very common plant, in bunches over the lower portion of the island. (No. 10 of Mr. Greene.)
921. *Mammillaria Goodrichii* Scheer.
- Mesembryanthemum crystallinum* L. Dr. Palmer says the "Ice plant" was very plentiful on the island, but sent in no specimens. Mr. Greene has, however, identified the species from this island. (No. 11 of Mr. Greene.)
920. *Hemizonia Streetsii* Gray. Collected quite abundantly. (No. 15 of Mr. Greene.) First collected here by Dr. Streets.
915. *Amblyopappus pusillus* Hook & Arn. (No. 16 of Mr. Greene.)
914. *Perityle Greenei* Rose. Bot. Gaz., xv., 117. (No. 17 of Mr. Greene.)
911. *Krynitzkia ambigua* Gray. Growing on the side of a cañon. The plant is clearly the one collected by Lieutenant Pond, but this, as well as Mr. Greene's type, has four nutlets. We have carefully compared both specimens with a very full set in the Gray Herbarium, and we have not been able to separate them. The nutlets are identical and there are specimens with the same habit. (*Cryptanthe patula* Greene.) (No. 21 of Mr. Greene.)
912. *Krynitzkia maritima* Greene. Only a few specimens were collected, as nearly all the plants were dead. The plants are found from 2 to 8 inches high and much branched. Growing on rocky sides of a cañon. (No. 20 of Mr. Greene.)
916. *Lycium Californicum* Nutt. (No. 19 of Mr. Greene.)
910. *Plantago Patagonica* Jacq. Quite common in sandy ravines. (No. 22 of Mr. Greene.)
919. *Euphorbia Benedicta* Greene. Pit., i, 263. Very common. (No. 7 of Mr. Greene.)
918. *Atriplex deltata* Greene. Pit., i, 267. The sterile plant.
907. The same species. The fertile plant. (No. 8 of Mr. Greene.)
906. *Brodiaea capitata* Benth. A very common plant on shady slopes. (No. 24 of Mr. Greene.)

GUADALUPE ISLAND PLANTS.

Botanists generally will be delighted to know that Dr. Palmer has again visited Guadalupe Island and brought back a large and interesting collection. Only a week was spent on the island, from March 27 to April 3, 1889, but he succeeded in laying in a good supply of a number of species only known from this island and sparingly represented in our herbaria. Besides these several new species were found. He began his collecting at the south end of the island, where the last three days of March were spent, and the first three days of April were spent at the north end of the island.

It will be remembered that in 1875 Dr. Edward Palmer spent three months (February to May) on this island. This was the first visit ever

made to Guadalupe Island by a botanist. The next year appeared Mr. Watson's admirable paper (Proc. Amer. Acad., vol. XI) on the flora of this island and a list of Dr. Palmer's plants, of which twenty-one were considered new.

Ten years afterward Mr. E. L. Greene spent a week (the last of April) adding to the flora fifteen species, describing seven new species, and publishing in 1885 (Bull. Cal. Acad., vol. 1) his notes, and a catalogue of the flowering plants and ferns of the island.

Mr. Watson separates the phænogamous plants into five groups as follows: (1) Introduced species, twelve; (2) species which range from the Pacific to the Atlantic States, nine; (3) those found in California as far north as San Francisco, forty-nine; (4) those only in southern California, eighteen; (5) those peculiar to the island itself, twenty-one. Add to these an undetermined *Heuchera* and six ferns makes a total of one hundred and sixteen Phænogams and Pteridophyta. Mr. Greene's list enumerates one hundred and thirty species, all except twenty-six he had observed in his short stay upon the island. Probably six of the fifteen added by Mr. Greene belong to the first group. Among the present additions at least four have very recently gained a foothold here, viz, *Melilotus Indica*, *Sonchus tenerrimus*, *Suaeda Torreyana*, and *Centaurea Melitensis*, making the total number of introduced species as twenty-two; one is to be added in the second group. In the third group, Mr. Greene's list adds five and ours three, viz, *Tissa macrotheca*, *Tissa pallida*, and *Trisetum barbatum*, making the number of distinctly Californian species fifty-seven.

In the fourth group the two *Cactaceæ* and two *Gramineæ* make the number of southern Californian species twenty-two. Of the fifteen additional species added by Mr. Greene but one he described as new, another probably new. Dr. Palmer has at this time collected seventy-two species, fourteen of which are additions to the flora of the island and four are new. The total number of species now known on the island is one hundred and forty-five. Of the thirty-four species first described from this island but three have since been found elsewhere. The following list so far as known is peculiar to the island:

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|--|--|
| 1. <i>Eschscholtzia Palmeri</i> Rose. | 16. <i>Perityle incana</i> Gray. |
| 2. <i>Lavatera occidentalis</i> Wat. | 17. <i>Baeria Palmeri</i> Gray. |
| 3. <i>Sphæralcea sulphurea</i> Wat. | 18. <i>Krynitzkia foliosa</i> Greene. |
| 4. <i>Sphæralcea Palmeri</i> Rose. | 19. <i>Harpagonella Palmeri</i> Gray. |
| 5. <i>Lupinus nireus</i> Wat. | 20. <i>Phacelia phyllomanica</i> Gray. |
| 6. <i>Lupinus Guadalupensis</i> Greene. | 21. <i>Phacelia floribunda</i> Greene. |
| 7. <i>Trifolium Palmeri</i> Wat. | 22. <i>Convolvulus occidentalis</i> Gray. |
| 8. <i>Hosackia ornithopus</i> Greene. | 23. <i>Convolvulus macrostegia</i> Greene. |
| 9. <i>Enanthe Guadalupensis</i> Wat. | 24. <i>Hesperolea Palmeri</i> Gray. |
| 10. <i>Megarrhiza Guadalupensis</i> Wat. | 25. <i>Atriplex Palmeri</i> Wat. |
| 11. <i>Galium angulosum</i> Gray. | 26. <i>Erythraa edulis</i> Wat. |
| 12. <i>Diplostegium canum</i> Gray. | 27. <i>Mimulus latifolius</i> Gray. |
| 13. <i>Hemizonia frutescens</i> Gray. | 28. <i>Pogogyne tenuifolia</i> Gray. |
| 14. <i>Hemizonia Greeneana</i> Rose. | 29. <i>Calamintha Palmeri</i> Gray. |
| 15. <i>Hemizonia Palmeri</i> Rose. | |

After those species collected by Dr. Palmer on his former trip, we have included the number and year in a parenthesis.

882. *Eschscholtzia Palmeri* Rose, n. sp. Small compact plants, from 1 to 2 inches high, annual, very glaucous: leaves compact, finely dissected into linear lobes: flowers large for the size of the plant, petals 5 to 6 lines long, yellow, orange at base: the peduncles (in fruit) 1 to 2 inches long: torus very thick, with no hyaline internal edge: pods $1\frac{1}{2}$ to $2\frac{1}{2}$ inches long, thick, straight, or slightly curved: calyptra oval, with short acute tip.
- March 29 or 30. Only seen on a rocky ledge, but there common. On south end of Guadalupe Island.
875. *Eschscholtzia ramosa* Greene. Bull. Torr. Club, XXII, 217. In cañons, but not common on the south end of the island. March 29 and 30. Also at San Benito, March 25, No. 909. Probably No. 3 of Mr. Watson's list. "*E. hypocoides* Var." This is the way Dr. Gray has referred the plant in herbarium specimens.
880. *Sisymbrium reflexum* Nutt. Shady portions of cañons on south end of the island. March 29. (No. 4 of 1875.)
854. The same. Two small plants found on the south end of the island.
897. *Lepidium Menziesii* D. C. South end of the island. March 29. (No. 7 of 1875.)
851. *L. lasiocarpum* Nutt. Only two specimens collected in a cañon at the south end. (No. 8 of 1875.)
841. The same. In a similar locality. This species was not found by Mr. Greene. (No. 8 of 1875.)
892. *Oligomeris subulata* Bois. Grows scattering along the arroyos.
845. The same. Found about the sandy beach at the north end. April 1 to 3. (No. 10 of 1875.)
864. *Tissa macrotheca* Britton. Torr. Bull., vol. XVI, p. 129. Common on exposed sides of hills, in arroyos, and sides of cañon. Not before reported from this island, and extends the range of the species considerably southward.
- 864a. *Tissa pallida* Greene. Bull. Torr. Club, vol. XVI, 129. Collected with the preceding, but not so common. This species was described in the Torrey Bulletin of 1889 (p. 129); has previously only been found near San Francisco and Monterey (?). We are indebted to Dr. N. L. Britton for the determination of these two species.
837. *Silene Gallica* Linn. Abundant about the beach. (No. 11 of 1875.)
846. *Claytonia perfoliata* Donn. In cañon at north end, where there is much shade and moisture. The flowers are said to be white. (No. 15 of 1875.)
844. *Calandrinia Menziesii* H. B. K., var. *caulescens* Gray. At the north end. (No. 14 of 1875.)
869. *Malva borealis* Wallman. In the former collection, only found from the middle of the island, but now introduced all over the island. (No. 16 of 1875.)
897. *Sphaeralcea Palmeri* Rose, n. sp. Stems 12 to 18 inches high, from a thick woody base, angled, covered with a dense, stellate pubescence: leaves broad-ovate, 2 to $2\frac{1}{2}$ inches long, thick, crenulate-toothed, obtuse: calyx 3 lines long, with broad lobes: petals canary-yellow, with pink varieties: the carpels 2 to $2\frac{1}{2}$ lines long. The upper margin is rather thick and broad and of different texture. The carpels are narrower and longer than in *S. sulphurea*, two ovules commonly maturing. Found in all exposed parts on the south end of the island. This species seems quite distinct from *S. sulphurea*.
861. *Lupinus niveus* Watson. Annual, 6 to 15 inches high; the ovate cotyledons (6 to 8 lines long) persistent; leaflets oblanceolate, obtuse; pods 1 to $1\frac{1}{2}$ inches long, two to five seeded; seeds 3 lines in diameter. In flower and fruit, March 29, on the south end of the island. Growing in sandy bed of cañon. (No. 25 of 1875.)

859. *Trifolium Palmeri* Watson. Quite common on the south end in wet sand in cañons. (No. 26 of 1875.)
832. The same. Very common in large masses in cañons and plains at the north end. This plant is widely distributed over the island, and forms the main food supply for the goats.
831. *Trifolium microcephalum* Pursh. A very common plant at the north end in cañons and exposed places. It is much eaten by goats. April 1. (No. 27 of 1875.)
840. *Melilotus Indica* All. Not before reported from the island. Common along the beach, ascending into shady cañons and perhaps introduced with the goats. North end of island. April 1 to 3.
853. *Hosackia ornithopus* Greene. Only one plant found near the mouth of a cañon at the north end. Mr. Greene found it abundant in the middle of the island, 1885. We have not seen Palmer's 1875 plant.
847. *Vicia exigua* Nutt. Common in shady sides of ravines at the north end. Dr. Palmer on his first visit only saw a single small specimen. Mr. Greene says it was not uncommon.
893. *Mentzelia dispersa* Watson. Common among shady rocks in cañons. South end of the island March 29. (No. 32 of 1875.)
850. *Galium aparine* L. At north end. April 1. (No. 35 of 1875.)
900. *Tillæa leptopetala* Benth.
902. *Opuntia prolifera* Engl. Grows on both ends of the island on stony ridges and steep mountain sides. 3 to 5 feet high; not in flower. Collected by Mr. Greene.
- Mesembryanthemum crystallinum* Linn. Dr. Palmer wrote that this grew on the island, but collected no specimens. Mr. Greene also collected it.
901. *Mamillaria Goodridgei* Scheer. With five to six globose heads. At first covered with a white wool but becoming glabrate. Common on south end of island. Not found by Dr. Palmer in 1875, but collected by Mr. Greene in 1885.
899. *Amblyopappus pusillus* H. & A. March 30. (No. 46 of 1875.)
849. *Microseris linearifolia* Gray. A few specimens only collected on the north end of the island. (No. 50 of 1875.)
895. *Filago Arizona* Gray. South end of the island. March 30. (No. 38 of 1875.)
885. *Gnaphalium Sprengelii* H. & A. Only three plants seen, these in the bed of an arroyo. South end. March 29. Collected by Palmer in 1875, but without number.
874. *Hemizonia* (*Hartmannia*) *Palmeri* Rose, n.sp. Perennial, with thick woody base, forming small bunches; branches decumbent or ascending, with abundant, white, silky pubescence, not at all viscid: leaves numerous, silky, 9 to 12 lines long, linear to narrowly oblanceolate: heads numerous, somewhat corymbose: involucre 2 lines high: rays eight, three-toothed: the chaff forming a cup about the disk-flowers cleft to the middle, the divisions linear-acuminate: disk flowers about ten, the akenes sterile: pappus of six to twelve, linear-acuminate scales, the ray akenes barely a line long, the rostellum very short, and compressed closely against the top of the akene.
- A peculiar species, and by far the most decided shrub of the genus. In many respects near to the following, but in leaves, pubescence, inflorescence, etc., very different. A very common plant on the south end of the island, in all exposed places Dr. Palmer writes that it is a very attractive plant in that dry latitude. The three species from this island seem to form a peculiar group by themselves.
865. *Hemizonia* (*Hartmannia*) *Greeneana* Rose, n. sp. Perennial, forming large round bunches 2 to 3 feet high, with sterile branches hanging down the sides, somewhat pubescent, more or less viscid throughout: leaves crowded, dark

green; those of the sterile branches lanceolate in outline, with a thick margin, 6 to 10 lines long, six to eight pinnately-toothed and parted, sometimes entire; those of the central flowering branches smaller, linear, entire: Heads single, terminating the branches: involucre 3 lines high: rays 8, three-toothed, the chaff forming a cup about the disk flowers, united until maturity, with eight ovate, acute-tipped teeth: disk flowers eight to ten, sterile: pappus of six to ten unequal paleaceous bracts, mostly shorter than the akene: the ray akenes over a line long, the rostellum a half line long.

- A very peculiar species, but seemingly nearest *H. frutescens* of this island. It differs from that species strikingly in manner of growth, in its inflorescence, in its leaves, and in its internal involucre. The akenes are very similar but larger. *H. frutescens* is a very rare species from near the central part of the island. This species is very common on the south end in all the arroyos, cañons, and along the beach. It is a very homely plant, growing in great clumps in barren places, and the most noticeable plant of the region.
- 876. *Bæria Palmeri* Gray.** First collected on this island by Palmer in 1875 and afterwards by Greene. It is very common at bottom of cañons at south end of island. March 29. (No. 45 of 1875.)
- 881. *Franseria camphorata* Greene.** Bull. Cal. Acad., i, 192. Very common on the south end of the island. March 29. (No. 40 of 1875.)
- 891. *Perityle* Grayi.** Rose, Bot. Gaz., xv., 118.
- 849. *Microseris linearifolia* Gray.** At the north end. (No. 50 of 1875.)
- 834. *Senecio Palmeri* Gray.** Dr. Palmer makes the following note with reference to this plant: "Since my previous visit to this island this plant has decreased; spots that contained a thicket of it have now but dead plants, with a few scattering plants alive." Professor Greene speaks of this plant as being quite common. The rapid extermination of this species seems to be a parallel case to that of *Cupressus Guadalupeensis*, spoken of by Mr. Greene. (Proc. Cal. Acad., I, 217.) Fortunately Dr. Palmer has laid in a supply of this species, and all our American herbaria will have good specimens, even if it should become extinct. (No. 45 of 1875.)
- 836. *Centauria Melitensis* Linn.** This weed has become introduced on the north end, and is gradually finding its way up the island. Not reported in the other lists from the island.
- 871. *Sonchus oleraceus* Linn.** Small, slender form, from 2 inches to a foot high; radical and lower cauline leaves mostly undivided. Shady spots in cañons; not very common. At the south end. (No. 52 of 1875.)
- 872.** The same, but somewhat taller, with pinnate leaves, the lobes spinulose-toothed. Also in cañons at the south end, but rarer.
- 873. *Sonchus tenerrimus* Linn.** A very small, slender form 2 to 8 inches high. Growing in shady cañons at the south end. An introduced species. Not before found on the island. Not common.
- 887. *Gilia Nevinii* Gray.** Only a half dozen plants seen on south end of island. When first collected in 1876 it was found very abundant. March 30, 1889. (No. 78 of 1875.)
- 833.** The same. A few plants found at the north end. April 1.
- 889. *Nemophila racemosa* Nutt.** Have seen no specimens of this species. The Guadalupe plants of Palmer, 1875 (No. 76), were referred to *N. aurita*. The linear segments of the leaves are strongly serrate. The flowers minute, apparently smaller than the species. Among rocks, edge of dry arroyo. March 30, south end of island.
- 852.** The same, from the north end, where it is more common, and found among rocks in cañons.

- 835. *Ellisia chrysanthemifolia*** Benth. The stems are prostrate or ascending, divaricate, very pubescent. Leaves mostly opposite, pinnate; the oval lobes toothed; calyx very small, shorter than the capsule. Corolla white, about the size of calyx. Only found in cañon at north end. April 1. (74 and 75 of 1875.)
- 866. *Phacelia floribunda*** Greene. Bull. Cal. Acad., i, 200. In shady cañon at the south end.
- 866a.** A small, almost simple form, 3 to 5 inches high, growing with the last.
- 833.** The same, from cañons at the north end. In all these cases the capsule is somewhat oblique, and only a single seed matures.
- 848. *Emmenanthe penduliflora*** Benth. Found in cañons and hill-sides, at both ends of the island. April 1. On the north end.
- 898.** The same, from the south end of island. March 30. (No. 73 of 1875.)
- 894. *Krynitzkia foliosa*** Greene. Certainly very distinct from *K. ambigua*. Only known from this island, but here common, growing with *K. maritima*. First collected by Palmer (No. 68 of 1875) and afterwards by Greene. Found in sandy arroyos and shady cañons. March 29 and 30. South end of the island. No. 877 the same.
- 842.** The same, from a cañon at the north end.
- 879. *K. maritima*** Greene. A small compact form, growing with No. 877 (No. 67 of 1876) on south end of island.
- 860. *Solanum nigrum*** Linn. var. About a foot high, glabrous; leaves dentate, small; flowers small (about two lines in diameter), violet. Only a single plant found growing among rocks in cañon, on south end of island. March 29. (No. 60 of 1875.)
- 839. *Mimulus latifolius*** Gray. (No. 58 of 1875.)
- 878. *Plantago Patagonica*** Jacq. South end of island; common. March 29. (No. 54 of 1875.)
- 888. *Pterostegia drymarioides*** F. & M. (No. 84 of 1875.) At south end. March 30.
- 843.** The same. Found in cañons among shady rocks at north end. April 1.
- 886. *Mirabilis Californica*** Gray. Common. (No. 82 of 1875.) South end of island. March 30.
- 884. *Parietaria debilis*** Foster. Common in shady cañons. (No. 87 of 1875.)
- 658. *Brodiaea capitata*** Benth. In deep ravines and on hill-sides on the south end of the island. Not reported in Mr. Watson's paper, but Dr. Palmer says it is now quite plentiful. Also found by Mr. Greene.
- 857. *Polypodium Californicum*** Kaulf. On the north end. (No. 103 of 1875.)
- 855. *Notholaena Newberryi*** Eaton. (No. 103 of 1875.)
- 856. *Gymnogramme triangulare*** Kanf.
- 656. *Muhlenbergia debilis*** Trin. Found in the shade of rocky ledges and also in the exposed part of a cañon of the southern part of the island.
- 670.** The same; collected at the northern end of the island. Goats do not eat this grass.
- 657. *Festuca tenella*** Willd. Habitat as 656. Saw no indications of the feeding of goats (the only animals here) upon this grass.
- 674.** The same; found the south of the island.
- 658. *Trisetum barbatum*** Steud. Evidently an annual; beyond the frost line it may be perennial. In dry seasons very little seed is formed, as the goats crop this plant closely (there is but scanty vegetation on this, the southern end of the island), but this year rain has been frequent, and this plant is abundant, enabling us to get ripe seed. This may be improved by cultivation, plants found in favorable situations becoming quite large. It also makes good hay.

667. The same; from northern part of island. Very common grass, making the best forage upon this end of the island. In the cañons it is very large, growing so thickly that it looks like grain.
673. The same.
668. *Avena barbata* L. Found some specimens 4 feet high in the cañons and on the rough slopes.
669. *Aristida bromoides* H. B. K. In deep cañons among other grasses and plants.
675. The same.
671. *Hordeum murinum* L. Very abundant, bidding fair to exterminate other grasses and plants.
672. *Festuca Myurus* L. Not common. Grows in bunches in cañons among other grasses.

HEAD OF THE GULF OF CALIFORNIA.

Three days were spent at Lerdo, Mexico. This locality is 60 miles south-southwest from Yuma, latitude $31^{\circ} 46' 10''$, and longitude $114^{\circ} 43' 30''$.

The most interesting thing obtained here was *Ammobroma*, which for the first time has been collected in good quantity.

956. *Nasturtium palustre* D. C.
955. *Achyronichia Cooperi* T. & G. Places in river bottoms. Lerdo, Mexico.
934. *Dalea Emoryi* Gray. In the deserts of southeast California and western Arizona, and south to Los Angeles Bay. One of the two hosts of *Ammobroma*.
941. *Oenothera scapoidea* Nutt. Var. Stems 4 to 8 inches high, much branched at base, lateral leaflets very small, or none; calyx dark red within, petals less than 2 lines long, light yellow. Hemsley does not mention this plant as growing in Mexico in Biol. Cent. Amer.
933. *Franseria dumosa* Gray. Also collected here by Dr. Edward Palmer in 1885. This species is common in the desert regions of south Utah, Arizona, southeast California, and extending as far south as Los Angeles Bay, Lower California. This is one of the two species upon which *Ammobroma Sonoræ* is found, and its wide distribution leads us to expect that other stations of that parasite will yet be found.
957. *Gnaphalium Sprengelii* H. & A. Dry places in river-bottoms.
940. *Palafoxia linearis* Lag. On the dry sand-hills.
- Ammobroma Sonoræ* Torr. This was first discovered in 1854 by Col. A. B. Gray, in charge of a railroad exploring party, at the head of the Gulf of California. At this time a short notice of the discovery was published by Col. A. B. Gray in Memoirs of the American Academy of Science, but it was not until 1867 that a description of the genus was published by Dr. John Torrey in the Annals of Lye. Nat. Hist. N. Y. Vol. VIII, p. 51, together with a good figure. So far as we can learn the plant was not collected again until Schuchard got it in Arizona. And now Dr. Palmer collected it in large quantities at Lerdo, Mexico. Until the present season its host plant has been unknown but Dr. Palmer has carefully examined into this, and collected two common plants of this arid region upon which it grows. These are *Franseria dumosa* and *Dalea Emoryi*. Dr. Palmer wrote that the plant grows in deep sand, the deeper the sand the larger and juicier the plants. The Cocopa Indians gather them for food, which they relish under all circumstances. They eat it raw, boiled, or roasted. The plant is full of moisture, and whites and Indians alike resort to it in traveling, as a valuable substitute for water. It has a pleasant taste, much resembling the sweet

potato. The stems are $2\frac{1}{2}$ feet long and 1 to 4 inches in diameter, but almost buried, only the peculiar white tops appearing above the sand. The Cocopa Indians call it "Oyutch." Colonel Gray gave much the same report of this plant. He says the Papago Indians dry the stems and grind them with the mesquit beans, forming what they call "pinole."

937. **Aphyllon Cooperi** Gray. Parasitic on *Franseria dumosa*. The Cocopa Indians also use this plant for food. It is very bitter, but this is mostly removed by boiling. They call it "nep-cha-ga." It grows in the sand.
938. This is the same. Parasitic on *Ephedra*.
953. **Amaranthus Palmeri** Wat. Var. A peculiar caespitose form, forming great mats, some stems with slender ascending or erect stems 4 to 10 inches long. At Lerdo, Sonora, Mexico, April 24 to 26, 1889. Grows in river-bottom, in rather dry places.
958. Probably the sterile of the same. Stems much branched at base and slender, **Sagittaria variabilis** Engl. The bulbs of this plant are much used by the Cocopa Indians either raw or roasted. Lerdo, Sonora.
- Ruppia maritima**, Linn. Lerdo, Sonora. Hemsley says that this species had not been collected in Mexico, although it might be expected.
931. **Scirpus maritimus**, Linn. *vide* F. V. Coville.
- 924-931. **Uniola Palmeri** Vasey. This grass was collected 35 miles south of Lerdo and about 15 miles from the mouth of the Colorado River. It grows abundantly on the tidal lands and forms almost the principal food-plant of the Cocopa Indians. A full account of this plant, with plate, appears in the Garden and Forest for August, 1889.
948. **Panicum colonum** Linn. An annual grass of which the seeds are used for food by the Indians.
947. **Panicum capillare** Linn. var. **miliaceum**, V. A peculiar variety with a drooping panicle, of the habit of *P. miliaceum* but with smaller spikelets. This is also used as food by the Indians, who sow the seeds in the rainy season.
946. **Lolium temulentum** Linn. Introduced.
945. **Diplachne imbricata** Scrib. This extends into Arizona and southern California.

UPON A COLLECTION OF PLANTS MADE BY MR. G. C. NEALLEY, IN THE
REGION OF THE RIO GRANDE, IN TEXAS, FROM BRAZOS SANTIAGO
TO EL PASO COUNTY.

By JOHN M. COULTER.

Mr. G. C. Nealley was engaged by the Division of Botany to make collections of plants during the seasons of 1887, 1888, and 1889, in the more unexplored parts of Texas, chiefly in the counties bordering the Rio Grande. It was hoped that many of the rarer plants of the Mexican Boundary Survey and other early collections would be re-discovered, that additional Mexican types would be found to be members of our flora, and that species new to science would be brought to light. How far these hopes have been realized is shown in the following report. It is to be regretted that in many cases the stations are no more definitely given, but they are given with all the fullness that the field-notes will justify.¹

1. *Clematis crispa* L. Near Brazos Santiago in April, and later at Ballinger (Runnels county).
2. *Clematis Drummondii* Torr. & Gray. In great abundance along the Rio Grande near Roma (Starr county).
3. *Clematis Pitcheri* Torr. & Gray. Concho county.
4. *Aquilegia chrysantha* Gray. Southwestern Texas.
5. *Cocculus diversifolius* DC. (*C. oblongifolius* DC.) Southwestern Texas. Two forms of this species occur in Mr. Nealley's collections; one with ovate leaves, the other with narrowly oblong leaves.
6. *Castalia elegans* Greene (*Nymphaea elegans* Hook.). Along the lower Rio Grande near Santa Maria (Cameron county), and apparently in considerable abundance. This rare and beautiful species, remarkable on account of its light blue petals, was discovered by Charles Wright in 1849, "near the head of the Leona River," a Texan tributary of the Rio Grande. Grown from seed at Kew, it was described and figured by Hooker in *Curt. Bot. Mag.*, t. 4604. Afterwards a single specimen was found by Berlandier in northern Mexico, and other specimens by Charles Wright in Cuba. For many years it was unreported, when it was re-discovered in 1887 at Waco, McLennan county, by Misses Trimble and Wright (reported by E. E. Stern in *Bull. Torr. Bot. Club*, xv, 13); and in 1888 by C. G. Pringle, in lagoons near Brownsville. *Bourgeau* 4, from Santa Anita, Mexico, referred in *Hemsl. Biol. Centr. Amer.*, i. 25, to this species, is probably *Castalia flava* Greene.

¹In the case of sets distributed before the publication of this contribution, the numbers on the labels should be changed to the serial numbers of this paper. Some changes, also, have been made in determination, and hence a few names on already distributed labels are misleading.

7. *Castalia flava* Greene (*Nymphaea flava* Leitner). Rio Grande City (Starr county). To this must be referred *Bourgeau* 4, from Santa Anita, Mexico, as noted under the preceding species. The discovery of this Florida yellow water-lily along the Rio Grande in Texas, as well as in Mexico, is an interesting one. In Pringle's distribution of 1888, no. 1956, from lagoons near Brownsville, is labeled *Nymphaea Mexicana* Zucc., and it is undoubtedly the same as our specimens from Mr. Nealley. There seems to be so much uncertainty, however, as to what *N. Mexicana* is, and our plants so closely accord with the well-known *Castalia flava*, that we have ventured to so name them. It is but fair to say that none of the Nealley specimens are in fruit, and it may be discovered that all of these Texano-Mexican yellow water-lilies are *Castalia Mexicana*.
8. *Nelumbo lutea* Pers. (*Nelumbium luteum* Willd.) Along the lower Rio Grande, near Santa Maria (Cameron county).
9. *Argemone platyceras* Link & Otto, var. *rosea* Coulter n. var. Petals bright rose-purple. Corpus Christi. This includes also the form referred to by Watson (*Proc. Am. Acad.*, xvii. 318) under *Palmer* 20.
10. *Thelypodium linearifolium* Watson. Limpia cañon (Presidio county).
11. *Thelypodium micranthum* Watson. Limpia cañon and Chenate Mountains (Presidio county). Mr. Nealley's plants are quite small and sometimes simple, some of them being not more than 9 inches or 1 foot high. They are sometimes also quite glabrous, even as to the lower leaves, and the stigma seems sessile. This species is confused in herbaria with *T. longifolium* Watson, in which the flowers are twice as large.
12. *Thelypodium Vaseyi* Coulter, n. sp. Glaucous and glabrous throughout, 6 to 9^{dm} high, branching, with coarse stems: leaves thin, oblanceolate, becoming narrower above, entire or lower leaves somewhat repand-denticulate, clasping by rounded auricles (or the lowest merely sessile), 2.5 to 10^{cm} long, 1.25 to 3.75^{cm} broad: flowers very small, white, about 3^{mm} high: pods very slender, becoming distant and ascending or erect, 3.75 to 5^{cm} long, on pedicels 6 to 8^{mm} long.—Near Rio Grande City, Texas (Nealley); also collected in 1881 by G. R. Vasey (no. 29) in the mountains west of Las Vegas, New Mexico, in immature condition. Vasey's plants were too young to be characterized, although Mr. Watson, to whom the specimens were submitted, considered them as probably representing a new species. Mr. Nealley's specimens supply nearly mature pods, which may become longer than noted in the description. The species seems to be very distinct from any other *Thelypodium*.
13. *Thelypodium Wrightii* Gray. Limpia cañon (Presidio county). Specimens in fine fruiting condition show pods mostly 3 inches long or over.
14. *Lesquerella argyrea* Watson (*Vesicaria argyrea* Gray). Roma (Starr county) and Chenate Mountains (Presidio county).
15. *Lesquerella Engelmanni* Watson (*Vesicaria Engelmanni* Gray). Camp Charlotte (Ixion county). The collection includes two forms: one leafy, with very narrow and entire leaves; the other with nearly all the leaves rather broad and sinuate-dentate.
16. *Lesquerella gracilis* Gray (*Vesicaria gracilis* Hook.). Brazos Santiago.
17. *Sisymbrium canescens* Nutt. Limpia cañon (Presidio county).
18. *Sisymbrium diffusum* Gray. Limpia cañon (Presidio county) and Chisos Mountains (Foley county). This species was collected by Wright and the Mexican Boundary Survey in the southwest corner of Texas. G. R. Vasey and Rusby have collected it in adjoining New Mexico, and Pringle in Mexico. Mr. Nealley's Limpia cañon specimens were collected at Wright's original station.
19. *Erysimum asperum* DC. Limpia cañon (Presidio county).

20. *Greggia camporum* Gray. Chenate Mountains (Presidio county). This species is remarkably variable, a fact which is better known in herbaria than in publication. Very little seems to have been added to Gray's original description in *Pl. Wright.*, i. 8, but the immaturity of his specimens prevented him from discovering certain characters which seem generic. No mention is made of the fact, nor does it appear in the plate in *Pl. Wright.*, that the mature stamens are strongly sagittate and coiled, as in *Thelypodium*. The pod, instead of being short and allied to that of *Synthlipsis*, is a silique (a fact recognized by Bentham & Hooker), often quite elongated (an inch or more), and usually more or less curved at maturity. In fact, the persistent septum is always curved, often strongly so. The sepals also become strongly reflexed. The species *G. camporum* presents such great variations in the size and shape of its leaves that extreme forms are never recognized by a collector as forms of the same species. These specimens from the Chenate Mountains have broad and sinuate-dentate leaves, the leaves being sometimes an inch broad and so deeply sinuate-dentate as to appear almost pinnatifid.
21. *Greggia camporum* Gray, var. *angustifolia* Coulter, n. var. Leaves mostly entire (occasionally sinuate-toothed) and very narrow (but 2 to 4mm broad).—Camp Charlotte (Ixion county). If certain intermediate forms were not common this variety would represent a fairly good species. The pods are also quite variable in length in the same specimen. Considering the great variability of the leaves and pods the following may be but another variety of this polymorphous species:
22. *Greggia linearifolia* Watson. Camp Charlotte (Ixion county), mixed with the last, to which it is closely related.
23. *Lepidium alyssoides* Gray. Camp Charlotte (Ixion county).
24. *Synthlipsis Berlandieri* Gray, var. *hispida* Watson. Brazos Santiago.
25. *Cakile maritima* Scop., var. *æqualis* Chapman. Brazos Santiago. A West Indian and Floridian species found along the Texan coast.
26. *Polanisia trachysperma* Torr. & Gray. Corpus Christi. Ballinger (Runnels county) and Limpia cañon (Presidio county).
27. *Ionidium polygalæfolium* Vent. Roma (Starr county).
28. *Polygala alba* Nutt. Brazos Santiago and Chenate Mountains (Presidio county).
29. *Polygala ovalifolia* DC. Western Texas.
30. *Polygala puberula* Gray. Santa Anna (Coleman county).
31. *Silene laciniata* Cav., var. *Greggii* Watson. Limpia cañon (Presidio county).
32. *Stellaria prostrata* Baldw. Santa Maria (Cameron county) and Chenate Mountains (Presidio county). The Chenate specimens are much smaller than usual.
33. *Talinum parviflorum* Nutt. Corpus Christi.
- 33a. *Talinum lineare* HBK. (*T. aurantiacum* Engelm.) Corpus Christi.
34. *Malva borealis* Wallr. Brazos Santiago. An Old World plant, apparently naturalized throughout our southern border from the Gulf coast of Texas to California.
35. *Callirrhoe lineariloba* Gray. Pena (Duval county).
36. *Malvastrum coccineum* Gray. Rio Grande City (Starr county).
37. *Malvastrum spicatum* Gray. Brazos Santiago. A Mexican species.
38. *Malvastrum tricuspidatum* Gray. Brazos Santiago. Specimens smaller in all dimensions than usual.
39. *Malvastrum Wrightii* Gray. Corpus Christi. A very small form, with unusually reduced bractlets.
40. *Anoda hastata* Cav. "Screw Bean" (Presidio county).
41. *Anoda pentaschista* Gray. Chenate Mountains (Presidio county). The lower leaves are rather larger than usual, some of them being broadly triangular

and 2 inches long by $1\frac{1}{2}$ inches wide. The variation in the leaves passing up the stem is remarkable. In addition to the broad triangular leaves, some are 3-lobed, then above become narrower and hastate, finally narrowing to linear, but always hastate.

42. *Sida hederacea* Gray. Pecos flats, near Pecos City (Reeves county).
43. *Sida lepidota* Gray. Chenate Mountains (Presidio county).
44. *Sida longipes* Gray. Pena (Duval county). This seems to be the first recorded collection of this species since Wright's in 1851 and that of the Mexican Boundary Survey. It very closely resembles *S. Lindheimeri* Eng. & Gray, but the muticous carpels, as well as the elongated fruiting pedicels, serve well to distinguish it.
45. *Sida physocalyx* Gray. Pena (Duval county).
46. *Abutilon Berlandieri* Gray. Corpus Christi (Nueces county) and San Diego (Duval county); also found in 1882 by G. W. Letterman at Laredo (Webb county) and distributed as *A. holosericeum* Scheele. A Mexican species, Berlandier's 1550, 3050, and 3108, from northeast Mexico, being the same.
47. *Abutilon crispum* Gray. Rio Grande City (Starr county).
48. *Abutilon holosericeum* Scheele. Santa Maria (Cameron county).
49. *Abutilon incanum* Don. (*A. Texense* Torr. & Gray). Rio Grande City (Starr county). *A. incanum* is a species of the Sandwich Islands, but considered by Dr. Gray (Proc. Am. Acad., xxii. 301) identical with our *A. Texense*, "notwithstanding the disjointed range."
50. *Abutilon Nealleyi* Coulter, *n. sp.* Stem slender, erect, 6 to 12^{dm} high, soft puberulent above, becoming glabrous below: leaves broadly cordate and long acuminate, entire or slightly crenate, green and soft puberulent (becoming glabrous) above, white with fine dense stellate pubescence beneath, 6 to 10^{cm} long, 5 to 7.5^{cm} wide, becoming smaller above, on long petioles (2.5 to 9^{cm} long), the lower with axillary fascicles of small leaves: flowers in loose, few-flowered, long peduncled, upper-axillary and terminal panicles, very small, not more than 4^{mm} high: calyx stellate-pubescent, deeply cleft, the ovate acute lobes about half as long as the petals and very much shorter than the carpels: petals yellow or orange, hardly 4^{mm} long: carpels 5, becoming 6 to 8^{mm} long, puberulent, with a short acuminate beak, 2 or 3-seeded; seeds usually with a tuft of white hairs.—Near Hidalgo (Hidalgo county). This species is an addition to the group of herbaceous, large-leaved, rather naked paniculate and small-flowered forms, represented heretofore by *A. Sonora* Gray, *A. reventum* Watson, and *A. Xanti* Gray. *A. Nealleyi* has much the smallest flowers, and looks somewhat like a species of *Bastardia*, but the 2 or 3-seeded carpels are plainly those of *Abutilon*.
51. *Abutilon parvulum* Gray. Near Pena (Duval county) and in the Chenate Mountains (Presidio county).
52. *Abutilon Wrightii* Gray. Corpus Christi.
53. *Sphæralcea ambigua* Gray. Pena (Duval county). *S. Emoryi* in Ives Col. Exp. Bot. 8, and Bot. Calif. partly, not Pl. Fendl. nor Pl. Wright. Abundant on the arid plains of southern California, Nevada, and Arizona, and now found in southern Texas.
54. *Sphæralcea angustifolia* Spach., var. *cuspidata* Gray. Camp Charlotte (Ixion county).
55. *Sphæralcea Fendleri* Gray. Chenate Mountains (Presidio county).
56. *Sphæralcea subhastata* Coulter, *n. sp.* Low (7 to 22^{cm}), fruticose and branching, covered throughout with coarse almost scurfy stellate-pubescence: leaves thick, ovate to oblong, mostly obtuse and subhastate, rugose and more or less serrate, 1.25 to 3.75^{cm} long, 10 to 16^{mm} broad, on thick petioles 6 to 16^{mm} long: flowers mostly solitary and axillary on very short pedicels: calyx cleft about half way, the lobes acute or somewhat acuminate, little more than half as

long as the purplish (in dried specimens) corolla, which is 1.25 to 2.5^{cm} in diameter: fruit subglobose, densely stellate-pubescent, with no apparent cusps.—“Screw Bean” (Presidio county). To this species is referred *Wright* 883 in part, collected in New Mexico in 1851; also *Palmer* 93, from Coahuila, Mexico, collected in 1890. The species is intermediate between *S. hastulata* Gray and *S. angustifolia*, var. *cuspidata* Gray. *Palmer* 93 was considered by Mr. Watson (Proc. Am. Acad., xvii. 331) to be a form of *S. hastulata*. Mature fruit, as well as the coarse stellate-pubescent, indicates a much closer relationship to *S. angustifolia*, var. *cuspidata*, under which polymorphous species it should be included if not entitled to specific rank. It differs, however, from that species in its low habit, short ovate or oblong subhastate leaves, solitary short-pediceled flowers, and its pointless carpels.

57. *Malachra palmata* Moench. Brazos Santiago.
58. *Hibiscus cardiophyllus* Gray. Rio Grande City (Starr county).
59. *Hibiscus Coulteri* Harvey. Chisos Mountains (Foley county). Pringle's Arizona specimens have petals purplish outside, but Nealley's are pure sulphur yellow, as in the original specimens of Wright and the Mexican ones of Coulter.
60. *Hermannia Texana* Gray. Rio Grande City (Starr county) and Pena (Duval county). Apparently somewhat abundant along the Texan frontier, but it seems not to have been recently reported from Texas.
61. *Linum rigidum* Pursh. Brazos Santiago.
62. *Malpighia glabra* L. Santa Maria (Cameron county).
63. *Janusia gracilis* Gray. Corpus Christi (Nueces county), San Diego (Duval county), in “western Texas” from several localities without specific stations, and in the Chenate Mountains (Presidio county).
64. *Guaiacum angustifolium* Engelm. (*Portiera angustifolia* Gray). Rio Grande City (Starr county). In *Proc. Am. Acad.*, xxii. 306, Dr. Gray says that the genus *Portiera* can not be kept up.
65. *Geranium caespitosum* James. Limpia cañon (Presidio county).
66. *Oxalis Berlandieri* Torr. Pena (Duval county). A species not very abundantly nor recently collected.
67. *Oxalis corniculata* L., var. *stricta* Sav. Santa Maria (Cameron county).
68. *Oxalis dichondraefolia* Gray. Santa Maria (Cameron county).
69. *Ptelea trifoliata* L., var. *mollis* Torr. & Gray. Devil's River (Val Verde county).
70. *Koeberlinia spinosa* Zucc. Roma (Starr county) and Limpia cañon (Presidio county).
71. *Zizyphus obtusifolius* Gray. Santa Maria (Cameron county) and Hidalgo (Hidalgo county).
72. *Karwinskia Humboldtiana* Zucc. Santa Maria (Cameron county).
73. *Ceanothus Greggii* Gray. Chisos Mountains (Foley county). A species heretofore known to extend from Utah to Arizona, New Mexico, and Mexico, and now discovered in western Texas.
74. *Adolphia infesta* Meisner. Limpia cañon (Presidio county).
75. *Urvillea Mexicana* Gray. Santa Maria (Cameron county) and Hidalgo (Hidalgo county).
76. *Cardiospermum molle* HBK. Limpia cañon (Presidio county). A north Mexican species new to our flora.
77. *Ungadia speciosa* Endl. Chenate Mountains (Presidio county).
78. *Rhus virens* Lindb. Limpia cañon (Presidio county).
79. *Crotalaria incana* L. Brazos Santiago. A common Mexican and West Indian species. Our specimens are quite low, with very villous-hirsute stems, not very much resembling the tall and rather smooth forms of *S. Florida* referred to this species.
80. *Melilotus Indica* All. (*M. parviflora* Desf.). Brazos Santiago.

81. *Hosackia rigida* Benth. (incl. *H. puberula* Benth. and *H. Wrightii* Gray). Chisos Mountains (Foley county). In *Bot. Calif.* i. 136, Dr. Watson suggests that *H. puberula* Benth. and *H. Wrightii* Gray are but forms of *H. rigida* Benth. Botanists will testify to the impossibility sometimes of distinguishing these species. In Nealley's collection there are some remarkable specimens that combine in one plant all the important characters of these three so-called species. Some of the peduncles are short, and others very long; the calyx-teeth equal the tube or are shorter; the leaves are from obovate or oblong to narrowly linear. These specimens should be referred to *H. puberula* if the old specific distinctions are to be kept up. After examining a large series of specimens, however, it seems best to consider them all but as forms of a wide-spread and very polymorphous species, of which *H. Bryanti* Brandegee (*Pl. Baja Calif.* 144) seems to be but another form.
82. *Psoralea linearifolia* Torr. & Gray, var. *robusta* Coulter, n. var. Whole plant, in all its parts, more robust than the type: leaves linear-oblong, 4 to 6^{cm} long, 5 or 6^{mm} wide, thickly black-dotted above and below: flowers mostly in clusters of three, distant along the rhachis.—Clarendon (Donley county). Collected by Nealley in 1888.
83. *Psoralea tenuiflora* Pursh. Chenate Mountains (Presidio county).
84. *Dalea alopecuroides* Willd. Limpia cañon (Presidio county).
85. *Dalea aurea* Nutt. Santa Anna (Coleman county).
86. *Dalea Domingensis* DC., var. *paucifolia* Coulter, n. var. Whole plant more hairy: leaflets but three or four pairs and larger: inflorescence becoming more or less compact-clustered in the upper axils, and the calyx-tube nearly glabrous, making very prominent the large amber-colored glands.—Rio Grande City (Starr county). This is also Palmer 1049, collected in northern Mexico between San Luis Potosi and Tampico, and referred by Hemsley to *D. Domingensis* DC. The species has been found in S. Florida, and Mr. Hemsley (*Biol. Central Amer.*, i. 239) credits it to Texas and New Mexico, but from what collectors we are not aware. Mr. Nealley's collection brings the first Texan specimens we have seen.
87. *Dalea formosa* Torr. Chenate Mountains (Presidio county).
88. *Dalea frutescens* Gray. Devil's River (Val Verde county), and Chenate Mountains (Presidio county).
89. *Dalea mollis* Benth. Chisos Mountains (Foley county).
90. *Dalea nana* Torr. Roma (Starr county).
91. *Dalea pogonathera* Gray. Roma (Starr county), and Chisos Mountains (Foley county). The Chisos specimens have unusually broad cuneiform leaflets. A Mexican species, apparently extending northward only into southern Texas and New Mexico.
92. *Dalea Wrightii* Gray. Chisos Mountains (Foley county). With unusually broad bracts.
93. *Petalostemon emarginatus* Torr. & Gray. Pena (Duval county).
94. *Petalostemon multiflorus* Nutt. Corpus Christi.
95. *Petalostemon violaceus* Michx., var. *tenuis* Coulter, n. var. A slender low form rarely as much as a foot high, with round or roundish-oblong small often few-flowered heads on long slender peduncles, and shorter pointed bracts (not equaling the calyx, and hence not very apparent in the head).—Santa Anna (Coleman county). Apparently the form referred to in *Pl. Fendl.* under no. 138. The species is an exceedingly variable one, but the above variety is so distinct in character that it seems to deserve a name and description.
96. *Astragalus leptocarpus* Torr. & Gray. Brazos Santiago.
97. *Astragalus Nuttallianus* DC., var. *trichocarpus* Torr. & Gray. Brazos Santiago. Apparently very common.

98. *Zornia tetraphylla* Michx. Pena (Duval county).
99. *Desmodium spirale* DC. Limpia cañon (Presidio county). This seems to be the first record of this Mexican species occurring in the United States. It is quite variable in its pubescence, as well as its leaves. Our specimens are all 3-foliolate, and hence seem not to be the same as *D. annuum* Gray (described from Wright's Sonoran specimens), which Grisebach has included under *D. spirale* DC. However, they are clearly the same as the Mexican *D. spirale* of Pringle, no. 612, and of Parry & Palmer, no. 181, and accord well with all published descriptions.
100. *Desmodium Wrightii* Gray. Chenate Mountains (Presidio county).
101. *Vicia Ludoviciana* Nutt. Point Isabel.
102. *Galactia heterophylla* Gray. Pena (Duval county) and Chenate Mountains (Presidio county). This remarkable species was first collected by Lindheimer. Nealley's collection brings excellent specimens from both Pena in eastern Texas, and the Chenate Mountains of western Texas.
103. *Cologania longifolia* Gray. Chenate Mountains (Presidio county).
104. *Phaseolus acutifolius* Gray. Limpia cañon (Presidio county). This species has heretofore been collected only in Arizona, New Mexico, and Mexico. Our specimens represent the large-leaved Mexican form.
105. *Phaseolus umbellatus* Britton. (*P. helvolus* of Am. authors, not of L.) Corpus Christi.
106. *Phaseolus macropoides* Gray. Chenate Mountains (Presidio county). So far as the United States is concerned this species has only been found in New Mexico by Wright, in 1851; by the Mexican Boundary Survey; and lately (1881) by Rusby in the Mogollon Mountains. Mr. Nealley's discovery of it in extreme western Texas not only brings us more of a rare plant, but considerably extends its range. Pringle 1233 (1887), from plains near Guerrero, Chihuahua, referred to *P. heterophyllus* Willd., also seems to be this species.
107. *Rhynchosia menispermoidea* DC. Corpus Christi.
108. *Rhynchosia Texana* Torr. & Gray. Corpus Christi.
109. *Hoffmanseggia Jamesii* Torr. & Gray. Pena (Duval county).
110. *Hoffmanseggia melanosticta* Gray. Chisos Mountains (Foley county). So far as I know, this species has been reported but once from the United States side of the Rio Grande, and then by Parry, in the valley of the Rio Grande below Donna Ana, in the Mexican Boundary Survey. It was found originally, and but once since, in northern Mexico (by Edwards at Rinconada and Monterey, and by Gregg near Buena Vista and in a valley near Azufrora), and is altogether one of the rarest of species. This Chisos Mountain collection contains quite an amount of fruiting and flowering material. The specimens conform exactly to the original description. In the case of the Mexican Boundary Survey specimens Dr. Torrey speaks of the plants differing somewhat from the description of Schauer in having only two or three pairs of leaflets, and the vexillum destitute of glands and dots. In the Nealley specimens the leaflets are three and four pairs (mostly the former), and the vexillum is decidedly dotted; the single specimen of Parry that we have seen shows the same characters. This species is the only American representative of the section *Melanosticta*, the two other species being South African. The section is characterized chiefly by the densely black-glandular calyxlobes. The species somewhat resembles our common *H. Jamesii* Torr. & Gray, but the leaflets are fewer, larger, and more distant, the whole plant more villous, and the legumes larger and much more muricate and glandular. As no description of the species has been published in English, and the Latin description is not very accessible, I append a translation of the description given in Walp. Ann. i. 257: "Fruticose: branchlets and racemes

- canescent with short villous retrorse hairs: leaves with two pairs of pinnae and a terminal pinna; pinnae all abrupt, with a mucronate rhachis; leaflets three or four pairs, obliquely elliptical, very short petiolulate, very obtuse or retuse, together with the rhachis loosely villous, black-punctate beneath, as are the calyx and legume: racemes terminal or lateral, peduncled, loose-flowered: legume two to three-seeded, muriculate, the short muriculations stellate-pilose at apex."
111. *Hoffmanseggia oxycarpa* Benth. Western Texas, collected in 1888. This seems to be a very rare species, having been reported only by *Wright* from Texas in 1851, and by the botanists of the *Mex. Bound. Surv.* from extreme western Texas.
 112. *Hoffmanseggia stricta* Benth. Corpus Christi (Nueces county) and Chenate Mountains (Presidio county).
 113. *Parkinsonia aculeata* L. Hidalgo (Hidalgo county).
 114. *Parkinsonia Torreyana* Watson. Hidalgo (Hidalgo county). The finding of this species along the lower Rio Grande was unexpected, as it has heretofore seemed restricted to southern and western Arizona and contiguous California. Its representative in the Rio Grande Valley is *P. florida* Watson, and they were thought to be as distinct in range as in characters, although the western type was for a time confused with that of the Rio Grande. Nealley's specimens, however, collected in both flower and fruit, show the characteristic inflorescence, the thick-edged pod with its double groove, and the leaflets of *P. Torreyana*. It is possible that the two forms should not be considered distinct species.
 115. *Cassia baubinioides* Gray. Roma (Starr county).
 116. *Cassia nictitans* L. Chenate Mountains (Presidio county).
 117. *Cassia procumbens* L. Pena (Duval county). This is a variable tropical-American species, first found in Texas by *Berlandier* (no. 2427), and afterward by the *Mex. Bound. Surv.* *Berlandier's* specimen is larger than the type. Nealley's specimens conform better in size, but have the decidedly larger stipules and flowers of the *Berlandier* specimen. In a species so widely extended and variable such variation counts for little.
 118. *Cassia pumilio* Gray. Chenate Mountains (Presidio county).
 119. *Desmanthus depressus* Humb. & Bonpl. Santa Maria (Cameron county). This species is abundant enough in southern Florida and the West Indies, also from northern Mexico southward, but has only occasionally been collected in Texas. The present collection indicates that it grows in abundance in Cameron county, the most southern coast county of Texas.
 120. *Desmanthus reticulatus* Benth. Corpus Christi (Nueces county) and Pena (Duval county).
 121. *Mimosa Berlandieri* Gray. Brazos Santiago. This rare species seems to have been collected heretofore only by *Schott*, along the lower Rio Grande in Texas, and by *Berlandier* (no. 3146) near Matamoros, on the Mexican side of the river. Both of these discoveries were reported in *Bot. Mex. Bound. Survey* (1859). Nealley's station, from which he has brought considerable material, is just north of the mouth of the Rio Grande.
 122. *Mimosa biuncifera* Benth. Southwestern Texas. Collected in 1887.
 123. *Mimosa dysocarpa* Benth. Limpia cañon (Presidio county). This species was collected by *Chas. Wright* in his New Mexican collection of 1851, and by *Emory* in the Mexican Boundary Survey. Since then, it was collected in 1874 in Arizona by *Rothrock*, and by *Pringle* in his Chihuahua collections. With the present collection in western Texas we have the range of this species extending throughout northern Mexico and adjacent parts of the United States.
 124. *Mimosa Lindheimeri* Gray. Roma (Starr county).

125. *Mimosa malacophylla* Gray. Santa Maria (Cameron county).
- 125a. *Mimosa strigillosa* Torr & Gray. Brazos Santiago.
126. *Leucæna retusa* Benth. Limpia cañon (Presidio county). This species was collected by Wright (no. 171) in western Texas in 1849, and in New Mexico (no. 1046) in 1851; then by the *Mexican Boundary Survey* (no. 318) in the valley of the Rio Grande below Donna Ana; most recently by *Reverchon* (no. 1262) on rocky bluffs near Junction City (Kimble county).
127. *Acacia amentacea* DC. Roma (Starr county). This collection brings to hand, for the first time, the mature legumes of this species, at least Benth., in his *Rev. Mimoseæ*, says "legumen ignotum," and I find no record of any subsequent discovery. The legume is short-stipitate, arcuate, 7.5 to 10^{mm} long, and but 4 to 6^{mm} wide. It thus differs from its congener, *A. flexicaulis*, in its stipitate and very narrow legume, as well as in its leaves with a single pair of pinnae.
128. *Acacia Berlandieri* Benth. Hidalgo (Hidalgo county). Apparently quite common on the dry hills of the lower Rio Grande.
129. *Acacia constricta* Benth. Roma (Starr county.) An abundance of fine fruiting specimens.
130. *Acacia Farnesiana* Willd. Hidalgo (Hidalgo county) and Roma (Starr county).
131. *Acacia filicina* Willd. Chisos Mountains (Foley County). Our plants show an unusual reduction of the leaves of this abundant and exceedingly variable species, the pinnae being 2 to 5 pairs, and the leaflets 5 to 10 pairs.
132. *Acacia flexicaulis* Benth. Santa Maria (Cameron county). This species seems to belong to both coasts, having been found by Dr. Palmer at Corpus Christi Bay, and by Mr. Nealley along the coast of Cameron county; also by Xantus along the coast of Lower California from Cape St. Lucas northward, and by Dr. Palmer at Los Angeles Bay.
133. *Pithecolobium (Unguis-cati) Texense* Coulter, *n. sp.* A shrub or small tree armed with short stout stipular spines, the inflorescence and branchlets puberulent: leaves with 1 or 2 pinnae, the lower pair (if any) much the smaller; leaflets in the upper part of pinnae 3 or 4 pairs, in the lower 1 or 2 pairs, obliquely elliptical and the terminal pair mostly obovate, venulose and with more or less excentric midrib, 6 to 10^{mm} long, 4 to 6^{mm} wide: peduncles (about 12^{mm} long) apparently in axillary clusters (in fact on very much reduced branches): spike rather loosely flowered, oblong, 2.5 to 4^{cm} long: the staminal tube exserted: pod coriaceous, becoming very hard and more or less arcuate, with the thickened edges somewhat impressed between the seeds, 10 to 15^{cm} long, 18 to 25^{mm} wide, about 8-seeded.—Near Roma (Starr county). This species bears a somewhat striking resemblance to *Acacia flexicaulis*, and it is more than probable that it has been collected and referred to that species. If collected only in foliage and fruit it would most probably be referred to *A. flexicaulis*. However, the flowers not only show the indefinite monadelphous stamens of the tribe *Ingeæ*, but the staminal tube is exserted. Belonging to the *Unguis-cati* section, it differs from those with oblong spikes in the leaves having usually a second and smaller pair of pinnae. Its nearest allies belong to tropical America, some of them reaching north into Mexico.
134. *Cowania plicata* D. Don. Chisos Mountains (Foley county). A north Mexican species, reported for the first time within our borders.
135. *Pallugia paradoxa* Endl. Near Bone Spring (Foley county).
136. *Sedum Wrightii* Gray. Devil's River (Val Verde county).
137. *Lythrum alatum* Pursh, var. *linearifolium* Gray. Santa Maria (Cameron county).
138. *Nesæa salicifolia* HBK. Santa Maria (Cameron county).
139. *Epilobium coloratum* Muhl. Chenate Mountains (Presidio county).

140. *Oenothera Drummondii* Hook. Corpus Christi.
141. *Oenothera Hartwegi* Benth. Pena (Duval county). Petals purplish veiny outside.
142. *Oenothera Hartwegi* Benth., var. *lavandulæfolia* Watson. "Screw Bean" (Presidio county).
143. *Oenothera Jamesii* Torr. & Gray. Chenate Mountains (Presidio county).
144. *Oenothera rosea* Ait. Santa Maria (Cameron county). Some of the specimens are simply puberulent, while others are quite villous. They all have rather broad lanceolate leaves. This South American and Mexican species has heretofore been reported from Arizona and New Mexico, but not from Texas.
145. *Oenothera rosea* Ait., var. *parvifolia* Coulter, *n. var.* Low and diffusely branching, 7.5 to 15^{cm} high, villous: leaves very much smaller than in the species, seldom 12^{mm} long: calyx purple.—Limpia cañon (Presidio county). Quite different in appearance from the species, being much smaller in all its parts. The red purple of the calyx and the lilac-purple of the corolla give a fuchsia-like look to the flowers.
146. *Oenothera serrulata* Nutt. Brazos Santiago. Petals purplish-veiny outside.
147. *Oenothera serrulata* Nutt., var. *spinulosa* Torr. & Gray. Devil's River (Val Verde county).
148. *Oenothera speciosa* Nutt. Santa Maria (Cameron county).
149. *Gaura coccinea* Nutt., var. *parvifolia* Torr. & Gray. Santa Anna (Coleman county). This variety at best seems to be a poorly defined one, as there is much intermingling of lanceolate and linear, denticulate and entire leaves upon individual specimens.
150. *Gaura Nealleyi* Coulter, *n. sp.* Near to *G. suffulta* Engelm.; but lower part of the stem sparingly hirsute, the rachis, calyx, and bracts glandular-pubescent: leaves rather crowded below, linear, acute, entire, closely sessile or somewhat tapering at base, glabrous except the minute and rigid more or less hooked hairs on the margins and midrib beneath, 12 to 36^{mm} long, but 2 or 3^{mm} broad: inflorescence few-flowered, rather loose: fruit as in *G. suffulta*, but with a tapering base or short stipe.—Chenate Mountains (Presidio county).
151. *Gaura parviflora* Dougl. Santa Maria (Cameron county).
152. *Gaura sinuata* Nutt. Camp Charlotte (Ixion county). Both the glabrous and hairy forms.
153. *Cevallia sinuata* Lag. Roma (Starr county), and Limpia cañon (Presidio county).
154. *Mentzelia multiflora* Gray. Camp Charlotte (Ixion county). A low form, with sharply acute petals and short turbinate capsules.
155. *Mentzelia oligosperma* Nutt. Limpia cañon (Presidio county).
156. *Mentzelia Wrightii* Gray. Limpia cañon (Presidio county).
157. *Eucnide bartonioides* Zucc. Devil's River (Val Verde county).
158. *Turnera diffusa* (?), var. *aphrodisiaca* Urban. (*T. aphrodisiaca* Ward.) Roma (Starr county). This is the first record of the discovery of the somewhat famous "Damiana" within our borders. It grows abundantly throughout western Mexico and Lower California, and more sparingly in eastern Mexico. The original description of Prof. L. F. Ward appears in the *Virginia Medical Monthly* for April, 1876.
159. *Passiflora foetida* L. Near Rio Grande City (Starr county).
160. *Passiflora inamœna* Gray. Hidalgo (Hidalgo county).
161. *Passiflora tenuiloba* Engelm. Roma and Rio Grande City (Starr county).
162. *Melothria pendula* L. Santa Maria (Cameron county) and Hidalgo (Hidalgo county).
163. *Cyclanthera dissecta* Arnott. Limpia cañon (Presidio county).
164. *Sesuvium Portulacastrum* L. Corpus Christi (Nueces county) and Camp Charlotte (Ixion county).

165. *Mollugo verticillata* L. Limpia cañon (Presidio county). A remarkable form of this widely distributed and polymorphous species. The leaves are all very short and broadly obovate, but leaf contours can not be made to define even a variety in this species.
166. *Daucus pusillus* Michx. Brazos Santiago.
167. *Eryngium Leavenworthii* Torr. & Gray. Pena (Duval county).
168. *Eryngium nasturtiifolium* Juss. Santa Maria (Cameron county). A south Mexican species, found in northern Mexico by Palmer and now discovered within our southern border (in the southernmost Gulf county) by Nealley.
169. *Eryngium Wrightii* Gray. Chenate Mountains (Presidio county). Heads sometimes more than 12^{mm} high, and bracts not twice as long.
170. *Ammoselinum Popei* Torr. & Gray. Brazos Santiago.
171. *Foeniculum vulgare* Gartn. Brazos Santiago.
172. *Apium leptophyllum* F. Muel. Brazos Santiago.
173. *Bowlesia lobata* Ruiz & Pavon. Brazos Santiago.
174. *Ammi majus* L. Brazos Santiago. This species was very probably collected on ballast, although possibly an introduced weed. It has been found on ballast at Philadelphia, and at Portland, Oregon.
175. *Bouvardia triphylla* Salisb., var. *angustifolia* Gray. Limpia cañon (Presidio county).
176. *Houstonia acerosa* Gray. Chisos Mountains (Foley county).
177. *Houstonia angustifolia* Michx. Chenate Mountains (Presidio county).
178. *Houstonia angustifolia* Mx., var. *filifolia* Gray. Corpus Christi (Nueces county) and Ballinger (Runnels county).
179. *Spermacoce glabra* Michx. Brazos Santiago.
180. *Galium microphyllum* Gray. Chenate Mountains (Presidio county).
181. *Galium virgatum* Nutt. Brazos Santiago.
182. *Galium Wrightii* Gray. Chenate Mountains (Presidio county). The bristles of the fruit are not always as long as its diameter.
183. *Stevia serrata* Cav. Limpia cañon (Presidio county).
184. *Carminatia tenuiflora* DC. Limpia cañon (Presidio county). Smaller plants than usual, some being not more than 6 inches high, with leaves proportionally reduced.
185. *Eupatorium ageratifolium* DC., var. *acuminatum* Coulter, n. var. Branchlets, lower leaf surface, and involueral bracts finely and often densely pubescent: leaves smaller (36 to less than 25^{mm} long), and sharply acuminate.—Point Isabel.
186. *Eupatorium Greggii* Gray. Chenate Mountains (Presidio county).
187. *Eupatorium solidaginifolium* Gray. Limpia cañon (Presidio county). The thyrsoid panicle becomes much larger and more lax and leafy than in the type specimens, and anything but "small," as in the original description. In the present specimens the panicle sometimes becomes 15 to 20^{cm} long and 14 to 18^{cm} across the base, being at the same time very lax and leafy. Associated with these large paniced specimens are others with panicles of the described dimensions.
188. *Eupatorium Wrightii* Gray. Chisos Mountains (Foley county). This beautiful species does not seem to have been reported within our border since Wright's original collection, the station of which was in the same general region as the present collection. Pringle collected it in 1885 in the mountains of Chihuahua.
189. *Brickellia oliganthes* Gray, var. *crebra* Gray. Chenate Mountains (Presidio county). This is the same as *Pringle* 635 (of 1885), from Chihuahua. The leaves are decidedly petioled and very different from those of the species.
190. *Kuhnia rosmarinifolia* Vent. Limpia cañon (Presidio county).
191. *Liatris punctata* Hook. Santa Anna (Coleman county).

192. *Gymnosperma corymbosum* DC. Limpia cañon (Presidio county).
193. *Gutierrezia Euthamiae* Torr. & Gray, var. *microcephala* Gray. Screw Bean (Presidio county).
194. *Gutierrezia Texana* Torr. & Gray. Screw Bean (Presidio county). Ligules unusually short and heads few-flowered.
195. *Grindelia inuloides* Willd. Corpus Christi.
196. *Chrysopsis villosa* Nutt., var. *canescens* Gray. Santa Anna (Coleman county), and Screw Bean (Presidio county).
197. *Chrysopsis villosa* Nutt., var. *hispida* Gray. Pena (Duval county).
198. *Xanthisma Texanum* DC. Ballinger (Runnels county).
199. *Aplopappus Nealleyi* Coulter, n. sp., § *Aplopappus* proper: From 3 to 6 dm high, somewhat branching above, glabrous or nearly so and somewhat glaucous, terminated by long (10 to 12.5 cm) naked (or minutely bracteate) peduncles which are enlarged beneath the large solitary heads: leaves narrowly linear or almost filiform, 2.5 to 5 cm long, entire or pinnatifid with two or three linear lobes: head about 2.5 cm broad; the involueral bracts oblong, obtuse, glabrous, dark-veined, loosely imbricated in about three successively shorter rows: rays ten to fifteen, narrowly linear, 12 to 18 mm long: disk-flowers with rather deeply lobed corolla: akenes 10-striate, the striae rugulose and sparsely pubescent, about 3 mm long: pappus of numerous scabrous rufous bristles: style-tips with short ovate appendages.—Santa Maria (Cameron county). This species is apparently related to *A. tenuilobus* Gray, but the almost smooth akenes and very short style appendages, as well as the smooth oblong, obtuse and unequal involueral bracts, and leaf characters, serve well to distinguish it.
200. *Aplopappus rubiginosus* Torr. & Gray. Pena (Duval county), and Chenate Mountains (Presidio county).
201. *Aplopappus rubiginosus* Torr. & Gray, var. *phyllocephalus* Gray. Corpus Christi and Point Isabel. Collected at former station also by Palmer.
202. *Aplopappus spinulosus* DC. Screw Bean (Presidio county).
203. *Aplopappus Texanus* Coulter, n. sp., § *Stenotus*: Low and somewhat lignescent at base, glabrous and somewhat glaucous, bearing a few medium-sized heads: leaves narrowly linear or almost filiform, 24 to 36 mm long, often fascicled in the axils: head 6 to 9 mm high; the involueral bracts oblong, obtuse or acutish, glabrous, yellowish tinged, loosely imbricated in about two nearly equal rows: rays few or none, exserted, ovate, not more than 3 mm long: disk-flowers with rather deeply lobed corolla: akenes 10-striate, the striae sparsely pubescent, 3 mm long: pappus of numerous scabrous white bristles.—Chisos Mountains (Foley county).—In foliage and akenes much resembling *A. Nealleyi*, but in size of heads, and character of involueral scales, rays, and pappus, very different. With the present grouping of species these differences refer the two species to different sections of the genus.
204. *Bigelovia Wrightii* Gray. Screw Bean (Presidio county).
205. *Solidago Missouriensis* Nutt. Screw Bean (Presidio county).
206. *Aphanostephus Arkansanus* Gray. Santa Maria (Cameron county).
207. *Aphanostephus Arkansanus* Gray, var. *Hallii* Gray. Point Isabel.
208. *Aphanostephus ramosissimus* DC. Santa Maria (Cameron county).
209. *Aster exilis* Ell. Screw Bean (Presidio county).
210. *Aster oblongifolius* Nutt., var. *rigidulus* Gray. Limpia cañon (Presidio county).
211. *Aster tanacetifolius* HBK. Screw Bean (Presidio county).
212. *Erigeron repens* Gray. Santa Maria (Cameron county).
213. *Erigeron strigosus* Muhl. Pena (Duval county). A very peculiar form, that would deserve at least varietal rank in almost any other group. Its characters belong to both *E. strigosus* and *E. annuus*, species which vary and

intergrade interminably. It is low and slender, a few inches to a foot high, with a cluster of spatulate more or less dentate or lobed leaves tapering into a long petiole, and long filiform branches bearing small and narrowly linear entire leaves and long-pedunculate solitary heads. The involucre is about as bristly as in *E. annuus*, and much of the pubescence is not appressed.

214. *Erigeron tenuis* Torr. & Gray. Point Isabel.
215. *Conyza Coulteri* Gray. Camp Charlotte (Ixion county). An unusually broad-leaved specimen.
216. *Baccharis angustifolia* Michx. On the Pecos near Pecos City (Pecos county).
217. *Baccharis Bigelovii* Gray. Chenate Mountains (Presidio county).
218. *Gnaphalium decurrens* Ives. Limpia cañon (Presidio county).
219. *Gnaphalium palustre* Nutt. Santa Maria (Cameron county).
220. *Gnaphalium Sprengelii* Hook. & Arn. Limpia cañon (Presidio county).
221. *Melampodium cinereum* DC. Roma (Starr county), and Limpia cañon (Presidio county).
222. *Berlandiera lyrata* Benth. Screw Bean (Presidio county).
223. *Parthenium incanum* HBK. Screw Bean (Presidio county).
224. *Hymenoclea monogyra* Torr. & Gray. Chisos Mountains (Foley county).
225. *Xanthium spinosum* L. Pena (Duval county). Introduced.
226. *Zinnia acerosa* Gray. Chenate Mountains and Screw Bean (Presidio county).
227. *Gymnolomia multiflora* Benth. & Hook. Chisos Mountains (Foley county).
228. *Gymnolomia tenuifolia* Benth. & Hook. Santa Maria (Cameron county), Chenate Mountains, and Screw Bean (Presidio county).
229. *Lepachys columnaris* Torr. & Gray, var. *pulcherrima* Torr. & Gray. Santa Maria (Cameron county).
230. *Viguiera longipes* Coulter, n. sp. Herbaceous, or somewhat lignescent at base, hispid and scabrous, 45 to 60^{cm} high, simple or somewhat branching above, ending in a long naked (rarely 1 or 2 bracteate) peduncle (15 to 25^{cm} long) bearing a solitary head (with sometimes shorter lateral peduncles): leaves all opposite, ovate-lanceolate to linear, three-ribbed from the base, from irregularly laciniate or toothed to almost entire, with margins mostly revolute, tapering at base into a more or less distinct petiole, 2.5 to 5^{cm} long: involucre about 12^{mm} high; bracts ovate, acute or the outer ones acuminate, somewhat coriaceous at base, hispid, the inner ones with softly ciliate margins, in two or three series: disk corollas with very narrow tube about as long as the awns, much enlarged above into a campanulate five-toothed limb: chaffy bracts of the receptacle gradually acuminate, with a strong blackish midrib: akenes narrowly oblong, sparingly pilose or glabrate, longer than the often unequal scabrous awns which are chaffy at base; the intermediate chaffy paleæ laciniate or erose.—Corpus Christi. Related in certain particulars to both *V. cordifolia* and *V. laciniata*, but very different from both.
231. *Helianthus ciliaris* DC. Santa Maria (Cameron county).
232. *Helianthus debilis* Nutt., var. *cucumerifolius* Gray. Chisos Mountains (Foley county).
233. *Flourensia cernua* DC. Chenate Mountains (Presidio county).
234. *Encelia calva* Gray. Roma (Starr county).
235. *Verbesina encelioides* Benth. & Hook. Corpus Christi.
236. *Verbesina Virginica* L. Santa Maria (Cameron county). A low depauperate simple form, only a foot high, with winged stem, and leaves abruptly wing-petioled.
237. *Synedrella vialis* Gray. Brazos Santiago.
238. *Heterospermum pinnatum* Cav. Limpia cañon (Presidio county).
239. *Coreopsis coronata* Hook. Brazos Santiago.
240. *Coreopsis tinctoria* Nutt. Chenate Mountains (Presidio county).

- 241. *Thelesperma gracile* Gray.** Corpus Christi (Nueces county), Pena (Duval county), Santa Anna (Coleman county), and Screw Bean (Presidio county). In the Santa Anna specimens the heads are nearly always radiate, with deep yellow rays about 6^{mm} long, and the pappus can hardly be called "subulate." In fact, descriptions have hardly done justice to the very conspicuous pappus, which is composed of two lanceolate, retrose, bristly scales nearly as long as the corolla-tube.
- 242. *Thelesperma longipes* Gray.** Screw Bean (Presidio county).
- 243. *Cosmos parviflorus* HBK.** Limpia cañon (Presidio county). Many of the akene beaks are four-awned.
- 244. *Bidens Bigelovii* Gray.** Limpia cañon (Presidio county).
- 245. *Perityle Vaseyi* Coulter, n. sp.** Minutely glandular pubescent, simple or with short branchlets, from a slightly lignescent base, 2 to 3^{dm} high, leafy: leaves large for the genus, 3.5 to 6.5^{cm} long, including the petiole (which is somewhat shorter than the blade), with broad outline, palmately or pinnately divided into three long-stalked broadly cuneate divisions; the divisions three to five-parted; the ultimate segments mostly cuneate and three-lobed: heads rather few and scattered, on long or short peduncles, 10 to 12^{mm} high: involueral scales linear-oblong, acute or acuminate, with margins more or less ciliate at tip: rays 4 to 6^{mm} long, deep yellow, oblong, three-toothed at apex: disk-corollas funnelform, yellow, 5^{mm} long: style-tips setaceous-filiform and hirsute: akenes oblong, pubescent on the faces, hispid-villous on the margins, 3.5^{mm} long, crowned with a pappus of bristle-like squamellæ and a single more or less barbellate awn as long as the akene.—Chisos Mountains (Foley county). Nearest *P. Parryi* Gray, but decidedly distinct, and in the shape of the disk-corolla not even a member of the same section.
- 246. *Baileya multiradiata* Harv. & Gray.** Chenate Mountains (Presidio county).
- 247. *Riddellia arachnoidea* Gray.** Chenate Mountains (Presidio county).
- 248. *Riddellia tagetina* Nutt.** Screw Bean (Presidio county).
- 249. *Bahia absinthifolia* Benth.** Rio Grande City (Starr county).
- 250. *Bahia absinthifolia* Benth., var. *dealbata* Gray.** Screw Bean (Presidio county).
- 251. *Bahia pedata* Gray.** Screw Bean (Presidio county).
- 252. *Schkuhria Wrightii* Gray.** Limpia cañon (Presidio county). A species of southern Arizona, whose range is thus extended across New Mexico into western Texas.
- 253. *Hymenothrix Wrightii* Gray.** Chenate Mountains (Presidio county). Not reported before east of Arizona in the United States, but Pringle has collected it in Chihuahua.
- 254. *Florestina tripteris* DC.** Point Isabel.
- 255. *Sartwellia Flaveriæ* Gray.** Screw Bean (Presidio county).
- 256. *Flaveria chloræfolia* Gray.** Screw Bean (Presidio county). Fine specimens of this imperfectly known species bring to light some additional characters. The plant becomes more than 6^{dm} high, with a thick stem, and the lower leaves become 7.5^{cm} long and 5^{cm} wide at the perfoliate base. The coarse glaucous stem, with its broad connate-perfoliate smooth and entire leaves, give the plant the look of an *Asclepias*. A more important fact is that all the Nealley material has pappus, composed of two to four thin paleæ, which are all on one side, leaving the other side naked. In the *Synopt. Flora* (p. 354) it is said that "a few flowers were once seen with a pappus of four thin paleæ." As this character appears in all of our abundant material the genus character should be amended in that character. It is impossible to admit these specimens into *Flaveria*, as defined by Bentham & Hooker or Gray, as "no pappus" is one of its distinctive characters.
- 257. *Porophyllum macrophyllum* DC.** Limpia cañon (Presidio county).
- 258. *Porophyllum scoparium* Gray.** Chisos Mountains (Foley county).

259. *Hymenatherum acerosum* Gray. Screw Bean (Presidio county).
260. *Hymenatherum Hartwegi* Gray. Screw Bean (Presidio county).
261. *Hymenatherum pentachætum* Gray. San Diego (Duval county).
262. *Hymenatherum tenuilobum* DC. Pena (Duval county), and Rio Grande City (Starr county).
263. *Hymenatherum Wrightii* Gray. Corpus Christi (Nueces county).
264. *Pectis filipes* Gray. Chenate Mountains (Presidio county).
265. *Pectis papposa* Gray. Chenate Mountains (Presidio county).
266. *Pectis tenella* DC. Rio Grande City (Starr county).
267. *Helenium amphibolum* Gray. Devil's River (Val Verde county).
268. *Helenium microcephalum* DC. Rio Grande City (Starr county).
269. *Amblyolepis setigera* DC. Ballinger (Runnels county).
270. *Gaillardia lanceolata* Michx. Pena (Duval county). Differs from the ordinary type in the fact that the leaves are all more or less toothed or even lobed, rather than "entire or sparsely serrate."
271. *Gaillardia pinnatifida* Torr. Ballinger (Runnels county), and Screw Bean, Chenate Mountains, and Limpia cañon (Presidio county). The Chenate specimens have almost all the leaves narrowly linear and entire.
272. *Gaillardia pulchella* Fong. Point Isabel.
273. *Actinella linearifolia* Torr. & Gray. Santa Anna (Coleman county), and Limpia cañon (Presidio county).
274. *Actinella scaposa* Nutt., var. *linearis* Nutt. Pena (Duval county), Chenate Mountains and Screw Bean (Presidio county). In the Pena specimens the rays are larger than usual, sometimes becoming 14 to 16^{mm} long.
275. *Artemisia filifolia* Torr. Screw Bean (Presidio county).
276. *Artemisia Ludoviciana* Nutt. Camp Charlotte (Ixion county). With narrow leaves and completely white-tomentose.
277. *Artemisia Mexicana* Willd. Limpia cañon (Presidio county).
278. *Artemisia redolens* Gray. Chisos Mountains (Foley county). This species is new to our borders, having been described from Pringle's collection of 1885 (no. 296) in the mountains of Chihuahua.
279. *Senecio Douglasii* DC. Screw Bean and Limpia cañon (Presidio county).
280. *Senecio lobatus* Pers. Brazos Santiago.
281. *Senecio multilobatus* Torr. & Gray. Limpia cañon (Presidio county).
282. *Cnicus altissimus* Willd., var. *filipendulus* Gray. Point Isabel.
283. *Perezia nana* Gray. Pena (Duval county).
284. *Trixis angustifolia* DC. Chisos Mountains (Foley county).
285. *Pyrrhopappus Carolinianus* DC. Point Isabel.
286. *Pyrrhopappus multicaulis* DC. Brazos Santiago.
287. *Lygodesmia aphylla* DC., var. *Texana* Torr. & Gray. Screw Bean (Presidio county).
288. *Lobelia Berlandieri* A. DC. Brazos Santiago. These specimens are undoubtedly *Berlandieri* 3177, which Dr. Gray suggests (*Synopt. Fl.* ii. 7) may be a depauperate form of *L. Cliffortiana* L. It also approaches *L. subnuda* in habit, the rosulate tuft of root-leaves being entirely unlike *L. Cliffortiana*, but the seeds are those of the latter species. If not entitled to specific rank it should probably become a variety or form of *L. Feayana* Gray.
289. *Lobelia cardinalis* L. Chenate Mountains (Presidio county). The narrow leaves suggest *L. splendens* Willd., but the plants are completely pubescent. These two species are too near together.
290. *Lobelia fenestralis* Cav. Chenate Mountains (Presidio county).
291. *Campanula rotundifolia* L. Chenate Mountains (Presidio county).
292. *Samolus ebracteatus* HBK. Camp Charlotte (Ixion county).
293. *Menodora heterophylla* Moricand. Dry hills, Roma (Starr county), and Ballinger (Runnels county).

294. *Menodora pubens* Gray. Camp Charlotte (Ixion county), and Chenate Mountains (Presidio County).
295. *Menodora scabra* Gray. Camp Charlotte (Ixion county), and Chenate Mountains (Presidio county).
- 295a. *Amsonia longifolia* Torr. Camp Charlotte (Ixion county).
296. *Philibertia cynanchoides* Gray. Pena (Duval county).
297. *Asclepias arenaria* Torr. Limpia cañon (Presidio county). A very glabrate form.
298. *Asclepias longicornu* Benth. Pena (Duval county).
299. *Asclepias perennis* Walt., var. *parvula* Gray. Limpia cañon (Presidio county).
300. *Metastelma barbigerum* Scheele. Corpus Christi (Nueces county), and Santa Maria (Cameron county).
301. *Gonolobus parviflorus* Gray. Pena (Duval county).
302. *Gonolobus reticulatus* Engelm. Hidalgo (Hidalgo county).
303. *Buddleia scordioides* HBK. Camp Charlotte (Ixion county). Specimens with the dense axillary flower clusters in contact with each other, giving the appearance of a long, thick spike from which the upper leaves project as bracts.
304. *Sabbatia calycosa* Pursh. Brazos Santiago.
305. *Eustoma Russellianum* Griseb. Pena (Duval county), and Hidalgo (Hidalgo County). In the Hidalgo specimens the petals are unusually narrow.
306. *Eustoma silenifolium* Salisb. (*E. exaltatum* Griseb). Hidalgo (Hidalgo county).
307. *Phlox Drummondii* Hook. Pena (Duval county).
308. *Phlox nana* Nutt. Chenate Mountains (Presidio county).
309. *Gilia Havardi* Gray. Chenate Mountains (Presidio county).
310. *Gilia incisa* Benth. Brazos Santiago.
311. *Gilia Macombii* Torr., var. *laxiflora* Coulter, n. var. Stems from a strong lignescent base: flowers very loosely cymose or scattered: corolla white (perhaps a little purplish-tinged), with tube 15 to 18^{mm} long, and ovate mucronulate lobes 4 or 5^{mm} long: stamens all included.—Camp Charlotte (Ixion county). The loose inflorescence, larger and white corolla with ovate lobes, and included stamens, distinguish this variety from the species, which has only been reported from the mountains of Arizona.
312. *Gilia rigidula* Benth., var. *acerosa* Gray. Camp Charlotte (Ixion county).
313. *Phacelia congesta* Hook. Limpia cañon (Presidio county).
314. *Phacelia patuliflora* Gray. Brazos Santiago.
315. *Nama dichotomum* Choix. Corpus Christi (Nueces county), Roma (Starr county), and Devil's River (Val Verde county). A species new to our boundary. The Corpus Christi and Roma specimens are typical; while the Devil's River specimens have narrower leaves, approaching the var. *angustifolium* Gray.
316. *Nama Jamaicense* L. Brazos Santiago.
317. *Nama organifolium* HBK. Roma (Starr county), and Limpia cañon (Presidio County).
318. *Nama undulatum* HBK. Brazos Santiago.
319. *Cordia Boissieri* A. DC. Roma (Starr county).
320. *Coldenia Greggii* Gray. Chisos Mountains (Foley county). "Equally inserted stamens," is one of the published generic characters of *Coldenia*; but these specimens of *C. Greggii* have unequally inserted stamens, the whole flower structure conforming more closely to that of *Draperia*, a Hydrophyllaceous genus, than to *Coldenia*. In fact, it is a pertinent question whether this species should not be transferred to *Draperia*.
321. *Coldenia hispidissima* Gray. Camp Charlotte (Ixion county).

322. *Heliotropium angustifolium* Torr. Camp Charlotte (Ixion county). Our plants represent this species in every particular except that the corolla-lobes are not "ovate and acute." The lobes are those of *H. tenellum*. Much of the "acuteness" of the lobes of *H. angustifolium* is apparently the result of drying.
323. *Heliotropium confertifolium* Torr. Roma (Starr county).
324. *Heliotropium convolvulaceum* Gray. Pena (Duval county).
325. *Heliotropium Curassavicum* L. Pecos Flats, near Pecos City (Pecos county).
326. *Heliotropium inundatum* Swartz. Hidalgo (Hidalgo county).
327. *Heliotropium tenellum* Torr. Pena (Duval county).
328. *Krynitzkia floribunda* Gray. Limpia cañon (Presidio county).
329. *Lithospermum Matamorensense* DC. Brazos Santiago.
330. *Ipomœa costellata* Torr. Limpia cañon (Presidio county).
331. *Ipomœa Nealleyi* Coulter, *n. sp.* Glabrous, with slender creeping or twining stems: leaves thin, triangular in outline, cordate at base with a broad sinus, angulately three-lobed (the lateral lobes resembling the basal lobes of a broadly hastate leaf, and often with an additional basal angle), 2 to 3^{cm} long and somewhat broader, angles all mucronulate, on slender petioles: peduncles slender, usually a little shorter than the petioles, one-flowered: sepals foliaceous, glabrous, loose, little if at all imbricated, linear-lanceolate, acuminate, conspicuous, nearly or quite as long as the tube of the corolla, 12 to 16^{mm} long, spreading in fruit: corolla broadly funnelform, 15 to 20^{mm} long, with purplish blue lobes and whitish tube: globose capsule glabrous.—Chenete Mountains (Presidio county). Related to *I. trifida* Don. and its allies.
332. *Ipomœa sinuata* Ortega. Pena (Duval county). Calyx shorter than usual.
333. *Ipomœa Texana* Coulter, *n. sp.* Apparently arborescent, glabrous, or minutely puberulent, with coarse branches: leaves thickish, entire or nearly so, sagittate, acuminate, the base with inconspicuous rounded lobes or truncate, 6 to 12^{cm} long, 3.5 to 5^{cm} broad at base, on petioles 3.5 to 7.5^{cm} long: peduncles mostly shorter than the petioles, bearing simple or compound few to several-flowered cymes: sepals short (6 or 7^{mm} long), somewhat coriaceous, minutely pubescent, broad and rounded or two-lobed at apex: corolla pink-purple, pubescent, 5 to 7.5^{cm} long.—Santa Maria (Cameron county.) A member of the arborescent group of *Ipomœas*, represented by the Mexican *I. murucoides* R. & S., to which our plant is related.
334. *Convolvulus hermannioides* Gray. Santa Maria (Cameron county).
335. *Evolvulus alsinoides* L. Pena (Duval county) and Roma (Starr county).
336. *Evolvulus sericeus* Swartz. Pena (Duval county). Flowers 10 to 12^{mm} in diameter.
337. *Dichondra argentea* Willd. Chenete Mountains (Presidio county).
338. *Cuscuta Californica* Choisy, var. *reflexa* Coulter, *n. var.* Flowers 4 to 5^{mm} long when the lanceolate subulate corolla-lobes are erect, but these soon sharply reflexed and as long as the tube: calyx-lobes acuminate, about equaling the corolla tube: scales somewhat prominent and lacerate: styles about as long as the ovary: corolla marcescent around the two to four-seeded capsule.—Roma (Starr county). Pringle 783 (collection of 1886), from Chihuahua, seems also to be a form of this variable species. Our variety has some important points of difference from the species and any published varieties, but it seems to be fairly included in the same specific relationship. If this conclusion is right the range of this Californian and Arizonian polymorphous species is extended through northern Mexico and into southern Texas.
339. *Solanum nigrum* L. Brazos Santiago. A pubescent, rather small, and entire leaved form of this exceedingly polymorphous species,

340. *Solanum triquetrum* Cav. Corpus Christi (Nueces county), Brazos Santiago (Cameron county), Ballinger (Runnels county), and Chenate Mountains (Presidio county).
341. *Solanum tuberosum* L., var. *boreale* Gray. Chenate Mountains (Presidio county).
342. *Nicotiana glauca* Graham. Roma and Rio Grande City (Starr county). Introduced.
343. *Nicotiana repanda* Willd. Corpus Christi (Nueces county), Brazos Santiago (Cameron county), and Chenate Mountains (Presidio county).
344. *Nicotiana trigonophylla* Duval. Chenate Mountains (Presidio county).
345. *Petunia parviflora* Juss. Corpus Christi.
346. *Leucophyllum minus* Gray. Santa Maria (Cameron county).
347. *Leucophyllum Texanum* Benth. Santa Maria (Cameron county).
348. *Stemodia lanata* Ruiz & Pavon. Brazos Santiago. A second species of this tropical genus which has reached our borders. Reported heretofore from south central Mexico (Toluca) and Tampico, at the southern extremity of the northern Gulf State (Tamaulipas) of Mexico, it is now found in the contiguous Gulf county of Texas.
349. *Herpestis chamædryoides* HBK., var. *peduncularis* Gray. Brazos Santiago.
350. *Herpestis Monniera* HBK. Corpus Christi.
351. *Seymeria virgata* Benth. Chenate Mountains (Presidio county). Apparently new to our flora, but collected by Pringle and Parry in northern Mexico.
352. *Castilleja lanata* Gray. Near Pecos City (Pecos county).
353. *Chilopsis saligna* Don. Camp Charlotte (Ixiou county).
354. *Tecoma stans* Juss. Limpia cañon (Presidio county).
355. *Elytraria bromoides* Ersted. Santa Maria (Cameron county). Confused with the next species, but very distinct. Collected also by Dr. Palmer (no. 2029) in 1879-'80 in northern Mexico.
356. *Elytraria tridentata* Vahl. Chenate Mountains (Presidio county).
357. *Calophanes linearis* Gray. Brazos Santiago (Cameron county), and Chenate Mountains (Presidio county).
358. *Ruellia tuberosa* L. Santa Maria (Cameron county), and Ballinger (Runnels county).
359. *Siphonoglossa Pilosella* Torr. Rio Grande City (Starr county).
360. *Dianthera Americana* L. Devil's River (Val Verde county). A curious form with sessile leaves which are broad at base, and not at all tapering. The same form was collected by the Mexican Boundary Survey (no. 724).
361. *Carlwrightia linearifolia* Gray. Chisos Mountains (Foley county). A very rare plant, not met with since its discovery by Mr. Wright, in 1849 (Gray in Proc. Am. Acad., xxi. 405). The leaves are longer and the bracts shorter than in the type.
362. *Lantana Camara* L. Brazos Santiago.
363. *Lantana macropoda* Torr. Brazos Santiago (Cameron county), Roma and Rio Grande City (Starr county) and Chenate Mountains (Presidio county).
364. *Lippia geminata* HBK. Brazos Santiago.
365. *Lippia lycioides* Steud. Corpus Christi (Nueces county) and Hidalgo (Hidalgo county).
366. *Lippia nodiflora* Michx. Pecos Flats, near Pecos City.
367. *Lippia Wrightii* Gray. Chenate Mountains (Presidio county).
368. *Verbena Aubletia* L. Brazos Santiago.
369. *Verbena ciliata* Benth. Brazos Santiago.
370. *Verbena officinalis* L. Brazos Santiago.
371. *Verbena Wrightii* Gray. Brazos Santiago.
372. *Duranta Plumieri* Jacq. Brazos Santiago.
373. *Mentha piperita* L. Limpia cañon (Presidio county). A hairy form.

374. *Micromeria Brownei* Benth., var. *pilosiuscula* Gray. Brazos Santiago.
375. *Hedeoma Drummondii* Benth. Pena (Duval county) and Rio Grande City (Starr county).
376. *Hedeoma plicata* Torr. Limpia cañon (Presidio county).
377. *Hedeoma thymoides* Gray. Chenate Mountains (Presidio county) and Chisos Mountains (Foley county).
378. *Poliomntha mollis* Gray. Chenate Mountains (Presidio county).
379. *Salvia angustifolia* Cav., var. *glabra* Gray. Limpia cañon (Presidio county).
380. *Salvia azurea* Lam. Limpia cañon (Presidio county).
381. *Salvia ballotaeflora* Benth. Brazos Santiago.
382. *Salvia coccinea* L. Brazos Santiago.
383. *Salvia lanceolata* Willd. Limpia cañon (Presidio county). In some specimens the leaves are nearly entire.
384. *Salvia spicata* R. & S. Ballinger (Runnels county).
385. *Salvia Texana* Torr. Pena (Duval county).
386. *Monarda punctata* L., var. *lasiodonta* Gray. Pena (Duval county).
387. *Scutellaria Drummondii* Benth. Brazos Santiago (Cameron county) and Chisos Mountains (Foley county).
389. *Marrubium vulgare* L. Point Isabel.
390. *Stachys agraria* Cham. & Schlecht. Brazos Santiago.
391. *Stachys Drummondii* Benth. Brazos Santiago.
392. *Tetraclea Coulteri* Gray. Roma (Starr county).
393. *Teucrium Cubense* L. Brazos Santiago.
394. *Teucrium laciniatum* Torr. Pena (Duval county).
395. *Plantago Patagonica* Jacq. Brazos Santiago.
396. *Plantago Virginica* L. Brazos Santiago.
397. *Plantago Virginica* L., var. *longifolia* Gray. Brazos Santiago.
398. *Mirabilis longiflora* L. Limpia cañon (Presidio county).
399. *Mirabilis multiflora* Gray. Pena (Duval county).
400. *Oxybaphus albidus* Sweet. Chenate Mountains (Presidio county).
401. *Oxybaphus angustifolius* Sweet. Limpia cañon (Presidio county).
402. *Oxybaphus nyctagineus* Sweet. Chenate Mountains (Presidio county) and Devil's River (Val Verde county).
403. *Nyctaginia capitata* Choisy. Roma (Starr county).
404. *Allionia incarnata* L. Brazos Santiago (Cameron county) and Roma (Starr county).
405. *Boerhaavia anisophylla* Torr. Chenate Mountains (Presidio county).
406. *Boerhaavia gibbosa* Pavon. Bone Spring (Foley county).
407. *Boerhaavia tenuifolia* Gray. Camp Charlotte (Ixion county).
408. *Boerhaavia viscosa* Lag. & Rodr. Pena (Duval county) and Limpia cañon (Presidio county). Varies greatly in amount of pubescence.
409. *Boerhaavia Wrightii* Gray. Chenate Mountains (Presidio county).
410. *Acleisanthes Berlandieri* Gray. Roma (Starr county).
411. *Acleisanthes longiflora* Gray. Roma (Starr county) and Ballinger (Runnels county).
412. *Selinocarpus angustifolius* Gray. Chenate Mountains (Presidio county).
413. *Selinocarpus chenopodioides* Gray. Chenate Mountains (Presidio county).
414. *Selinocarpus diffusus* Gray. Camp Charlotte (Ixion county).
415. *Paronychia dichotoma* Nutt. Chisos Mountains (Foley county).
416. *Celosia paniculata* L. Devil's River (Val Verde county).
417. *Amarantus fimbriatus* Benth. Chisos Mountains (Foley county).
418. *Amarantus Pringlei* Watson. Limpia cañon (Presidio county). This species was found by Mr. Pringle in 1886 growing abundantly on rocky hills of Chihuahua, Mexico. Mr. Nealley now finds it extending northward within our borders on the rocky hills of the Limpia.

419. *Cladotrix lanuginosa* Nutt. "Pecos Flats," near Pecos City.
420. *Gomphrena nitida* Rothrock. Corpus Christi. With rose-tinted heads.
421. *Frœlichia Florida* Moq. Pena (Duval county).
422. *Frœlichia gracilis* Moq. Pena (Duval county).
423. *Iresine alternifolia* Watson, var. *Texana* Coulter, n. var. Leaves small, ovate to lanceolate, 12 to 25^{mm} long, tapering to a short petiole.—Chenate Mountains (Presidio county). This seems clearly the same species as that described by Dr. Watson from the mountains about Guaymas, Mexico, collected by Dr. Palmer. It seems hardly necessary to set up a new species on leaf characters, especially when the leaves of the species are very variable. Apparently the only alternate-leaved *Iresine*.
424. *Atriplex canescens* James. Pecos Flats, near Pecos City.
425. *Salicornia ambigua* Michx. Pecos Flats, near Pecos City.
426. *Suaeda suffrutescens* Watson. Pecos Flats, near Pecos City.
427. *Rivina lævis* L. Pena (Duval county).
428. *Eriogonum Abertianum* Torr. Camp Charlotte (Ixion county).
429. *Eriogonum annuum* Nutt. Near Pecos City (Pecos county).
430. *Eriogonum Havardi* Watson. Camp Charlotte (Ixion county). Abundant specimens of a very rare and interesting species.
431. *Eriogonum Jamesii* Benth. Limpia cañon (Presidio county).
432. *Eriogonum longifolium* Nutt. Pena (Duval county).
433. *Eriogonum Nealleyi* Coulter, n. sp., § *Ganyama*: Perennial, the woody caudex branched and leafy: the loosely branching (Ephedra-like) stems, as well as the pedicels and flowers, glabrous and leafless: leaves all at or near the base, more or less broadly spatulate, tapering into a long petiole, villous pubescent on both surfaces, 5 to 7.5^{cm} long (including the petiole): involucres few and long-pedunculate: flowers greenish, occasionally with a pinkish tint: sepals lanceolate to ovate, acute or obtuse, the inner ones usually shorter and broader.—Near Pecos City (Pecos county). A species nearly related to *E. ciliatum* Torr. and *E. atrorubens* Engelm., both of northern Mexico. It differs from *E. ciliatum* in its completely villous leaves and green flowers; from *E. atrorubens* in both these characters as well as the shape of the leaves; and from both in that the leaves are not all radical.
434. *Eriogonum tenellum* Torr. Pena (Duval county).
435. *Eriogonum tenellum* Torr., var. *caulescens* Torr. & Gray. Pena (Duval county).
436. *Eriogonum Wrightii* Torr. Chenate Mountains (Presidio county).
437. *Rumex Berlandieri* Meisn. Brazos Santiago.
438. *Euphorbia acuta* Engelm. Pecos City (Pecos county).
439. *Euphorbia albomarginata* Torr. & Gray. Rio Grande City (Starr county), and Limpia cañon (Presidio county).
440. *Euphorbia campestris* Cham. & Schlecht. Limpia cañon (Presidio county).
441. *Euphorbia chamaesula* Boiss. Chenate Mountains (Presidio county).
442. *Euphorbia commutata* Engelm. Brazos Santiago.
443. *Euphorbia Fendleri* Torr. & Gray. Pena (Duval county).
444. *Euphorbia lata* Engelm. Ballinger (Runnels county), and Camp Charlotte (Ixion county).
445. *Euphorbia marginata* Pursh. Ballinger (Runnels county).
446. *Euphorbia montana* Engelm. Limpia cañon (Presidio county).
447. *Euphorbia polycarpa* Benth. Rio Grande City (Starr county), and Chenate Mountains (Presidio county).
448. *Euphorbia polycarpa* Benth., var. *vestita* Watson. Chenate Mountains (Presidio county).
449. *Euphorbia Vaseyi* Coulter, n. sp., § *Trichero stigma*: A shrub with straight branches, glabrous or the young branches puberulent: leaves minutely puberulent or glabrate, fascicled upon much reduced wart-like villous branchlets.

(from which also arises a solitary long-pedicelled flower), narrowly obovate, tapering to the sessile base, 15 to 30^{mm} long, and 4 to 9^{mm} wide: pedicels mostly somewhat shorter than the leaves, hairy, as are also the involucre: capsules 6^{mm} long, and 9 or 10^{mm} broad, with rounded lobes, smooth or somewhat granulate: seeds round-ovate, very minutely reticulated, 4^{mm} long.—Brazos Santiago. Near *E. misera* Benth., but apparently higher, branches not tortuous, with leaves not round, longer, and not petioled, and capsule much larger.

450. *Euphorbia villifera* Scheele. Limpia cañon (Presidio county).
451. *Euphorbia zygophylloides* Boiss. Santa Anna (Coleman county).
452. *Phyllanthus polygonoides* Spreng. Near Pecos City (Pecos county), and Santa Anna (Coleman county).
453. *Croton balsamiferus* Willd. Brazos Santiago. Apparently a form of this species, but with smaller leaves and larger flowers than the Florida specimens.
454. *Croton Cortesianus* HBK. (*C. trichocarpus* Torr.) Santa Maria (Cameron county).
455. *Croton corymbulosus* Engelm. Santa Anna (Coleman county), and Pena (Duval county).
456. *Croton fruticosus* Torr. Pena (Duval county), and Chenate Mountains (Presidio county).
457. *Croton Lindheimerianus* Scheele. Rio Grande City (Starr county), and Chenate Mountains (Presidio county).
458. *Croton maritimus* Walt. Brazos Santiago.
459. *Croton Neo-Mexicanus* Muell. Ballinger (Runnels county).
460. *Croton suaveolens* Torr. Limpia cañon (Presidio county). The leaves somewhat larger than in the type.
461. *Croton Texensis* Muell. Corpus Christi (Nueces county), and Pena (Duval county).
462. *Croton Torreyanus* Muell. (*C. suaveolens* Torr., var. *oblongifolius* Torr.) Hidalgo (Hidalgo county).
463. *Croton virens* Muell. (*C. muricatus* Nutt.) Chenate Mountains (Presidio county). Dr. Engelmann considered this but a form of *C. Texensis* Muell. (Bot. Wheeler's Report, p. 243.)
464. *Argythamnia humilis* Muell. Rio Grande City (Starr county), Ballinger (Runnels county), and Chisos Mountains (Foley county).
465. *Argythamnia lævis* Muell. Near Pecos City (Pecos county).
466. *Bernardia myricæfolia* Watson. Santa Maria (Cameron county).
467. *Acalypha hederacea* Torr. Rio Grande City (Starr county).
468. *Acalypha Lindheimeri* Muell. Limpia cañon (Presidio county).
469. *Acalypha radians* Torr. Rio Grande City (Starr county).
470. *Tragia urticæfolia* Michx. Rio Grande City (Starr county).
471. *Stillingia angustifolia* Engelm. (*S. sylvatica* L., var. *linearifolia*.) Pena (Duval county), Santa Anna (Coleman county), and Pecos City (Pecos county).
472. *Stillingia Torreyana* Watson. Rio Grande City (Starr county).
473. *Urtica chamædryoides* Pursh. Brazos Santiago.
474. *Quercus hypoleuca* Engelm. Limpia cañon (Presidio county). Leaves narrow, and some of them spinulose-dentate.
475. *Cooperia Drummondii* Herb. Corpus Christi.
476. *Zephyranthes Texana* Herb. Corpus Christi.
477. *Agave maculosa* Hooker. Hidalgo (Hidalgo county).
478. *Agave variegata* Jacobi. Hidalgo (Hidalgo county).
479. *Hesperanthes Torreyi* Watson. Limpia cañon (Presidio county).
480. *Allium Palmeri* Watson. Chenate Mountains (Presidio county).
481. *Heteranthera graminea* Vahl. Santa Maria (Cameron county).

482. *Heteranthera limosa* Vahl. Limpia cañon (Presidio county).
 483. *Heteranthera Mexicana* Watson. Devil's River (Val Verde county). This species was discovered by Dr. Palmer (no. 1324) in 1879-'80, in Coahuila, Mexico. The present collection extends its known range into southwestern Texas.
 484. *Commelyna Virginica* L. Brazos Santiago.
 485. *Tinantia anomala* Clarke. Pena (Duval county).
 486. *Tradescantia leiandra* Torr. Limpia cañon (Presidio county). Excellent specimens of this rare Texano-Mexican species.
 487. *Tradescantia leiandra* Torr., var. (?) *ovata* Coulter, *n. var.* Like *T. leiandra*, except that the leaves are short and rather broadly ovate (4 to 5^{cm} long, and 2 to 2.75^{cm} broad).—Chenate Mountains (Presidio County). Insufficient flowering material compels the reference of this form as a variety of *T. leiandra*.

The following species of *Juncus* were determined by Mr. F. V. Coville, and represent collections made by Mr. Nealley in 1888 and 1889. It is to be regretted that no more specific locality than "Western Texas" can be given for the collection of 1888, and hence that general locality is intended when that year is given:

488. *Juncus acuminatus* Michx. 1888.
 489. *Juncus acuminatus* Michx., var. *legitimus* Engelm. 1888.
 490. *Juncus acuminatus* Michx., var. *robustus* Engelm. 1888.
 491. *Juncus brachycarpus* Engelm. 1888.
 492. *Juncus dichotomus* Ell. 1888.
 493. *Juncus effusus* L. 1888.
 494. *Juncus Elliottii* Chapman. 1888.
 495. *Juncus marginatus* Rostk. 1888.
 496. *Juncus marginatus* Rostk., var. *biflorus* Engelm. 1888.
 497. *Juncus nodosus* L., var. *megacephalus* Torr. Ballinger (Runnels county). 1889.
 498. *Juncus repens* Michx. 1888.
 499. *Juncus scirpoides* Lam., var. *macrostemon* Engelm. 1888.
 500. *Juncus scirpoides* Lam., var. *polycephalus* Engelm., forma *major* and forma *minor*. 1888.
 501. *Juncus setaceus* Rostk. 1888.
 502. *Juncus tenuis* Willd. 1888.
 503. *Juncus xiphioides* Meyer, var. *montanus* Engelm. Chenate Mountains (Presidio county). 1889.
 504. *Sagittaria variabilis* Engelm. Brazos Santiago.
 505. *Echinodorus radicans* Engelm. Santa Maria (Cameron county).
 506. *Ruppia maritima* L. Brazos Santiago.

The following species of *Cyperaceæ* have been determined by Mr. F. V. Coville and include Mr. Nealley's collection of 1888 and 1889. The year of collection is indicated with each species.

507. *Cyperus acuminatus* Torr. & Hook. In the vicinity of Sabine Pass (Jefferson county), 1888; Brazos Santiago (Cameron county), 1889.
 508. *Cyperus aristatus* Rottb. Chenate Mountains (Presidio county), 1889.
 509. *Cyperus articulatus* L. In the vicinity of Sabine Pass (Jefferson county), 1888.
 510. *Cyperus Buckleyi* Britton. Chenate Mountains (Presidio county), 1889.
 511. *Cyperus compressus* L. In the vicinity of Sabine Pass (Jefferson county), 1888.
 512. *Cyperus cyrtolepis* Torr. & Hook. In the vicinity of Sabine Pass (Jefferson county), 1888.

513. *Cyperus diandrus* Torr., var. *capitatus* Britton. In the vicinity of Sabine Pass (Jefferson county), 1888; Chenate Mountains (Presidio county), 1889.
514. *Cyperus dissitiflorus* Torr. In the vicinity of Sabine Pass (Jefferson county), 1888; Chenate Mountains (Presidio county), and Chisos Mountains (Foley county), 1889.
515. *Cyperus echinatus* Britton. In the vicinity of Sabine Pass (Jefferson county), 1888.
516. *Cyperus erythrorhizos* Muhl. In the vicinity of Sabine Pass (Jefferson county), 1888.
517. *Cyperus esculentus* L. In the vicinity of Sabine Pass (Jefferson county), 1888.
518. *Cyperus esculentus* L., var. *angustispicatus* Britton. In the vicinity of Sabine Pass (Jefferson county), 1888.
519. *Cyperus esculentus* L., var. *macrostachyus* Boeck. In the vicinity of Sabine Pass (Jefferson county), 1888.
520. *Cyperus Fendlerianus* Boeck. 1889, with no station.
521. *Cyperus ferax* Richard. 1889, with no station.
522. *Cyperus giganteus* Vahl. Brazos Santiago, 1889.
523. *Cyperus Haspan* L. In the vicinity of Sabine Pass (Jefferson county), 1888.
524. *Cyperus Luzulæ* Rottb., var. *umbellatus* Britton. In the vicinity of Sabine Pass (Jefferson county), 1888.
- 524a. *Cyperus*, n. sp.? Intermediate between *C. speciosus* and *C. oxycarioides*, distinct in appearance from both, but with few technical characters to distinguish it from the former. Rio Grande City (Starr county), 1889.
525. *Cyperus ovalaris* Torr. In the vicinity of Sabine Pass (Jefferson county), 1888.
526. *Cyperus oxycarioides* Britton. In the vicinity of Sabine Pass (Jefferson county), 1888; Brazos Santiago (Cameron county), 1889.
527. *Cyperus polystachyus* Rottb., var. *leptostachyus* Boeck. In the vicinity of Sabine Pass (Jefferson county), 1888.
528. *Cyperus reflexus* Vahl. In the vicinity of Sabine Pass (Jefferson county), 1888.
529. *Cyperus refractus* Engelm. In the vicinity of Sabine Pass (Jefferson county), 1888; Brazos Santiago (Cameron county), 1889.
530. *Cyperus rotundus* L. In the vicinity of Sabine Pass (Jefferson county), 1888; Brazos Santiago (Cameron county), 1889.
531. *Cyperus Rusbyi* Britton. Chenate Mountains (Presidio county), 1889.
532. *Cyperus Schweinitzii* Torr. 1889, with no station.
533. *Cyperus speciosus* Vahl. Pena (Duval county), 1889.
534. *Cyperus strigosus* L., var. *compositus* Britton. In the vicinity of Sabine Pass (Jefferson county), 1888.
535. *Cyperus strigosus* L., var. *gracilis* Britton. In the vicinity of Sabine Pass (Jefferson county), 1888.
536. *Cyperus Surinamensis* Rottb. In the vicinity of Sabine Pass (Jefferson county), 1888.
537. *Cyperus Torreyi* Britton. In the vicinity of Sabine Pass (Jefferson county), 1888; Brazos Santiago (Cameron county), 1889.
538. *Cyperus uniflorus* Torr. & Hook. In the vicinity of Sabine Pass (Jefferson county), 1888; Brazos Santiago (Cameron county), Rio Grande City (Starr county), and Chisos Mountain (Foley county), 1889.
539. *Cyperus uniflorus* Torr. & Hook., var. *pumilus* Britton. 1889, with no station.
540. *Kyllingia brevifolia* Rottb. In the vicinity of Sabine Pass (Jefferson county), 1888.

541. *Kyllingia caespitosa* Nees. In the vicinity of Sabine Pass (Jefferson county), 1888.
542. *Eleocharis acicularis* R. & S. Brazos Santiago, 1889.
543. *Eleocharis capitata* R. Br. Pena (Duval County), 1889.
544. *Eleocharis montana* R. & S. Point Isabel and Brazos Santiago.
545. *Eleocharis palustris* R. & S. Point Isabel, 1889.
546. *Dichromena cephalotes* Britton. In the vicinity of Sabine Pass (Jefferson county), 1888.
547. *Dichromena latifolia* Baldwin. In the vicinity of Sabine Pass (Jefferson county), 1888.
548. *Fimbristylis autumnalis* R. & S. In the vicinity of Sabine Pass (Jefferson county), 1888.
549. *Fimbristylis capillaris* Gr. Chenate Mountains (Presidio county), 1889.
550. *Fimbristylis castanea* Vahl. In the vicinity of Sabine Pass (Jefferson county), 1888.
551. *Fimbristylis laxa* Vahl. In the vicinity of Sabine Pass (Jefferson county), 1888.
552. *Fimbristylis spadicea* Vahl. (the type?) In the vicinity of Sabine Pass (Jefferson county), 1888.
553. *Scirpus carinatus* Gray. In the vicinity of Sabine Pass (Jefferson county), 1888.
554. *Scirpus pungens* Vahl. Pena (Duval county), 1889.
555. *Fuirena squarrosa* Mx., var. *brevisetata* Coville. In the vicinity of Sabine Pass (Jefferson county), 1888.
556. *Fuirena squarrosa* Mx., var. *hispida* Chapm. In the vicinity of Sabine Pass (Jefferson county), 1888.
557. *Hemicarpha micrantha* Britton. (*H. subsquarrosa* Nees.) Chenate Mountains (Presidio county), 1889.
558. *Rhynchospora caduca* Ell. Near Sabine Pass, 1888.
559. *Rhynchospora corniculata* Gr. Near Sabine Pass, 1888.
560. *Rhynchospora cymosa* Nutt. Form. Near Sabine Pass, 1888.
561. *Rhynchospora Elliottii* Dietr. Near Sabine Pass, 1888.
562. *Rhynchospora glomerata* Vahl., var. *paniculata* Chapm. Near Sabine Pass, 1888.
563. *Rhynchospora inexpansa* Vahl. Near Sabine Pass, 1888.
564. *Rhynchospora patula* Gr. Near Sabine Pass, 1888.
565. *Rhynchospora plumosa* Ell. Near Sabine Pass, 1888.
566. *Rhynchospora plumosa* Ell., var. *intermedia* Chapm. Near Sabine Pass, 1888.
567. *Rhynchospora pusilla* Chapm. Near Sabine Pass, 1888.
568. *Rhynchospora rariflora* Ell. Near Sabine Pass, 1888.
569. *Scleria oligantha* Ell. Near Sabine Pass, 1888.

The following grasses have been determined by Dr. George Vasey, and include the collections made in southern and southwestern Texas by Mr. Nealley during the three seasons of 1887, 1888, and 1889. For the plants of the first two seasons no specific locality can be given, so that when no station is mentioned the general range of "southern and southwestern Texas" is intended, and the date of collection is either 1887 or 1888. The collection of 1889 may be recognized by having the stations specified, at least within a county. Special attention was given to the collection of grasses, so that the following list is a very complete one:

570. *Tripsacum dactyloides* L.
571. *Tripsacum monostachyum* Willd. Ballinger (Runnels county).
572. *Imperata Hookeri* Rupt.
573. *Erianthus brevibarbis* Michx.
574. *Erianthus saccharoides* Michx.

575. *Erianthus strictus* Baldwin.
576. *Rottbœllia cylindrica* Chapman.
577. *Hemarthria fasciculata* Kunth. Limpia cañon (Presidio county).
578. *Manisuris granularis* Swartz. Introduced.
579. *Trachypogon polymorphus* Hack.
580. *Elionurus barbiculmis* Hack. (*E. candidus* Torr.) Chenate Mountains (Presidio county).
581. *Elionurus tripsacoides* HBK. (*E. Nuttallii* Vasey.)
582. *Elionurus tripsacoides* HBK., var. *ciliaris* Hack. (*E. ciliaris* HBK.)
583. *Andropogon argyræus* Schult.
584. *Andropogon cirrhatus* Hack. Limpia cañon (Presidio county).
585. *Andropogon Elliottii* Chapm.
586. *Andropogon Hallii* Hack. Pena (Duval county) and Santa Anna (Coleman county).
587. *Andropogon hirtiflorus* Kunth. Chenate Mountains (Presidio county).
588. *Andropogon macrourus* Michx.
589. *Andropogon provincialis* Lam. (*A. furcatus* Muhl.).
590. *Andropogon saccharoides* Swartz, var. *submuticus* Vasey. Corpus Christi (Nueces county).
591. *Andropogon saccharoides* Swartz, var. *Torreyanus* Hack. Chenate Mountains (Presidio county).
592. *Andropogon scoparius* Michx.
593. *Andropogon tener* Kunth. Point Isabel.
594. *Andropogon Virginicus* Linn.
595. *Andropogon Wrightii* Hack.
596. *Sorghum Halapense* Pers. Introduced.
597. *Chrysopogon avenaceum* Benth.
598. *Chrysopogon nutans* Benth.
599. *Heteropogon contortus* R. & S. Chenate Mountains (Presidio county).
600. *Hilaria cenchroides* HBK., var. *Texana* Vasey, n. var. Differs from the type in its taller and more slender culm, longer leaves, longer more slender spike, with 7 to 9 narrower more distant spikelets.—Pena (Duval county). Possibly a distinct species.
601. *Hilaria Jamesii* Benth.
602. *Hilaria mutica* Benth. Pena (Duval county).
603. *Tragus racemosus* Hall. Introduced.
604. *Paspalum Buckleyanum* Vasey. Corpus Christi (Nueces county).
605. *Paspalum ciliatifolium* Muhl.
606. *Paspalum distichum* L. Corpus Christi (Nueces county).
607. *Paspalum Drummondii* Vasey.
608. *Paspalum Floridanum* Michx.
609. *Paspalum Floridanum* Michx., var. *glabratum* Engelm.
610. *Paspalum fluitans* Kunth.
611. *Paspalum furcatum* Flugge (*P. Digitaria* Chapman).
612. *Paspalum læve* Michx. Santa Maria (Cameron county).
613. *Paspalum læve* Michx., var. *angustifolium* Vasey (*P. angustifolium* Le Conte).
614. *Paspalum lentiferum* Lam. (*P. praeox* Walt.).
- 614a. *Paspalum lividum* Trin. Point Isabel.
615. *Paspalum monostachyum* Vasey.
616. *Paspalum platycaule* Poir.
617. *Paspalum plicatulum* Michx.
618. *Paspalum pubiflorum* Rupt. (*P. Hallii* V. & S.).
619. *Paspalum pubiflorum* Rupt., var. *glaucum* Scribner.
620. *Paspalum setaceum* Michx. Pena (Duval county).

621. *Paspalum vaginatum* Swartz. Near the coast.
 622. *Paspalum virgatum* L., var. *pubiflorum* Vasey.
 623. *Paspalum Walterianum* Schult.
 624. *Eriochloa polystachya* HBK. Brazos Santiago (Cameron county) and Chenate Mountains (Presidio county).
 625. *Eriochloa punctata* Hamil.
 626. *Eriochloa sericea* Munro. Ballinger (Runnels county).
 627. *Panicum agrostoides* Muhl.
 628. *Panicum anceps* Michx.
 629. *Panicum angustifolium* Ell.
 630. *Panicum autumnale* Bosc.
 631. *Panicum barbinode* Trin. Probably introduced.
 632. *Panicum bulbosum* HBK. Ballinger (Runnels county) and Chenate Mountains (Presidio county).
 633. *Panicum capillare* L.
 634. *Panicum capillarioides* Vasey, *n. sp.* With the general habit of *P. capillare*, 30 to 45 cm high: panicle not as full, with fewer less divided and more rigid branches: spikelets twice as large, 5 mm long: first glume one-third as large as the second, three to five nerved: second and third glumes equal, as long as the spikelet, about fifteen-nerved, lance-oblong, smooth: palea of the sterile flower small (1 to 1.5 mm long): perfect flower less than 2 mm long, smooth and shining.—Point Isabel.
 635. *Panicum ciliatissimum* Buckl. Hidalgo (Hidalgo county).
 636. *Panicum colonum* L.
 637. *Panicum commutatum* Schult. (*P. nervosum* Ell).
 638. *Panicum consanguineum* Kunth.
 639. *Panicum Crus-galli* L.
 640. *Panicum depauperatum* Muhl.
 641. *Panicum dichotomum* L.
 642. *Panicum diffusum* Swartz. Point Isabel. An addition to our flora.
 643. *Panicum fasciculatum* Swartz.
 644. *Panicum filiforme* L.
 645. *Panicum gymnocarpum* Ell.
 646. *Panicum Hallii* V. & S. Point Isabel.
 647. *Panicum Havardii* Vasey.
 648. *Panicum hians* Ell.
 649. *Panicum lachnanthum* Torr. Point Isabel and Corpus Christi.
 650. *Panicum latifolium* L.
 651. *Panicum laxiflorum* Lam.
 652. *Panicum microcarpon* Muhl.
 653. *Panicum neuranthum* Griseb.
 654. *Panicum nitidum* Lam.
 655. *Panicum obtusum* HBK.
 656. *Panicum paspaloides* Pers.
 657. *Panicum pedicellatum* Vasey.
 658. *Panicum platyphyllum* Munro.
 659. *Panicum proliferum* Lam.
 660. *Panicum prostratum* Lam.
 661. *Panicum reticulatum* Torr.
 662. *Panicum Reverchonii* Vasey.
 663. *Panicum sanguinale* L.
 664. *Panicum scabriusculum* Ell. ?
 665. *Panicum scoparium* Lam.
 666. *Panicum sparsiflorum* Vasey (*P. angustifolium* Chapman, not Ell.)
 667. *Panicum sphærocarpon* Ell.

668. *Panicum stenodes* Griseb.
669. *Panicum subspicatum* Vasey. Hidalgo (Hidalgo county).
670. *Panicum Texanum* Buckley.
671. *Panicum virgatum* L. Ballinger (Runnels county).
672. *Panicum viscidum* Ell.
673. *Oplismenus setarius* R. & S.
674. *Setaria caudata* R. & S. Pena (Duval county).
675. *Setaria caudata* R. & S., var. *pauciseta* Vasey. Pena (Duval county)
676. *Setaria glauca* P. Br., var. *flava* Vasey.
677. *Setaria glauca* P. Br., var. *laevigata* Chapm.
678. *Setaria imberbis* R. & S.
679. *Setaria setosa* Beauv.
680. *Cenchrus echinatus* L.
681. *Cenchrus myosuroides* HBK. Chenate Mountains (Presidio county).
682. *Cenchrus tribuloides* L.
683. *Stenotaphrum Americanum* Schkr.
684. *Zizania aquatica* L.
685. *Zizania miliacea* Michx. (*Zizaniopsis* Doell.).
686. *Leersia hexandra* Swartz.
687. *Leersia monandra* Swartz.
688. *Leersia oryzoides* Swartz.
689. *Leersia Virginica* Willd.
690. *Phalaris intermedia* Bosc.
691. *Phalaris intermedia* Bosc., var. *angusta* Chapm.
692. *Aristida Arizona* Vasey. Santa Anna (Coleman county).
693. *Aristida desmantha* Tr. & Rupt.
694. *Aristida dichotoma* L.
695. *Aristida dispersa* Trin. Chenate Mountains (Presidio county).
696. *Aristida gracilis* Ell.
697. *Aristida Havardii* Vasey.
698. *Aristida Humboldtiana* Trin.
699. *Aristida oligantha* Michx.
700. *Aristida palustris* Vasey.
701. *Aristida purpurascens* Poir., var. *minor* Vasey.
702. *Aristida purpurea* Nutt. Point Isabel.
703. *Aristida purpurea* Nutt., var. *Berlandieri* Trin.
704. *Aristida purpurea* Nutt., var. *Hookeri* Trin.
705. *Aristida purpurea* Nutt., var. *micrantha* Vasey. Pena (Duval county).
706. *Aristida Reverchoni* Vasey.
707. *Aristida Schiediana* Trin. Limpia cañon (Presidio county).
708. *Aristida Schiediana* Trin., var. *minor* Vasey. Limpia cañon (Presidio county).
709. *Aristida stricta*, var. *Nealleyi* Vasey, *n. var.* Culms cespitose, slender, erect, wiry, unbranched, 45^{cm} high: leaves erect, setaceous, 5 to 15^{cm} long, pungently pointed: panicle spike-like, very narrow, 10 to 15^{cm} long, two or three spikelets at each joint, one sessile, one or two short-pedicelled, appressed: spikelets about 8^{mm} long: lower empty glumes rather shorter than upper: upper one nearly equal to the flowering glume or to the furcation: flowering glume about 8^{mm} long beside the awns, scabrous, the short stipe pubescent: awns nearly equal, 10 to 12^{mm} long.—Chenate Mountains (Presidio county). Shorter and less rigid than the type.
710. *Stipa flexuosa* Vasey. Chenate Mountains (Presidio county).
711. *Stipa pennata*, var. *Neo-Mexicana* Thurber.
712. *Stipa setigera* Presl. Point Isabel.
713. *Stipa tenuissima* Trin.

714. *Stipa viridula* Trin., var. *robusta* Vasey, *n. var.* Culms densely tufted, 12 to 18^{dm} high, stout, leafy: lower sheaths loose and broad, longer than the internodes; blades flat and wide or involute above, often 6^{dm} long, scabrous: panicle dense and large, erect, 25 to 40^{cm} long: empty glumes 10^{mm} long, three to five nerved, callus short, densely hairy.—Chenate Mountains (Presidio county). Ranges from Colorado to Mexico.
715. *Oryzopsis fimbriata* Vasey.
716. *Oryzopsis membranacea* Pursh (*O. cuspidata* Benth.).
717. *Oryzopsis micrantha* Thurber?
718. *Muhlenbergia arenicola* Buckley.
719. *Muhlenbergia Berlandieri* Trin.
720. *Muhlenbergia Buckleyana* Scribner, *n. sp.* This is *M. Texana* Buckley (Proc. Phila. Acad., 1862), a name antedated by *M. Texana* Thurber. Pena (Duval county).
721. *Muhlenbergia capillaris* Kunth.
722. *Muhlenbergia diffusa* Schreb.
723. *Muhlenbergia distichophylla* Kunth.
724. *Muhlenbergia gracilis* Trin.
725. *Muhlenbergia gracillima* Torr.
726. *Muhlenbergia Lemmoni* Scribner, *n. sp.* Culms much branched below, slender, erect or decumbent, 30 to 45^{cm} high: leaves 2.5 to 7.5^{cm} long, 2^{mm} wide, acuminate: panicle spike-like, 5 to 12.5^{cm} long, interrupted below, the upper branches sessile, the lower pedicelled and subdivided, sometimes 2.5 to 5^{cm} long, erect: spikelets about 3^{mm} long without the awns: empty glumes ovate-lanceolate, awn-pointed, nearly equal and but little shorter than the flowering glume, which is hairy below and with an awn half or as long as itself.—Ballinger (Runnels County): also in New Mexico, Arizona, and Mexico. A member of a very variable group, resembling *M. sylvatica*.
727. *Muhlenbergia monticola* Buckley. Ballinger (Runnels county).
728. *Muhlenbergia setifolia* Vasey.
729. *Muhlenbergia Texana* Thurber.
730. *Muhlenbergia tricholepis* Torr.
731. *Muhlenbergia trichopodes* Chapman. Ballinger (Runnels county).
732. *Muhlenbergia virescens* Trin.
733. *Muhlenbergia Wrightii* Vasey.
734. *Lycurus phleoides* HBK.
735. *Alopecurus aristulatus* Michx.
736. *Sporobolus airoides* Torr.
737. *Sporobolus argutus* Kunth, var. *Arkansanus* Vasey. Point Isabel.
738. *Sporobolus asper* Kunth. Santa Anna (Coleman county).
739. *Sporobolus asper* Kunth, var. *Hookeri* Vasey. Santa Anna (Coleman county).
740. *Sporobolus asperifolius* Thurber. Pena (Duval county).
741. *Sporobolus asperifolius* Thurb., var. *brevifolius* Vasey. Pena (Duval county).
742. *Sporobolus Buckleyi* Vasey. Point Isabel.
743. *Sporobolus confusus* Vasey (*S. ramulosus* of authors). Limpia cañon (Presidio county).
744. *Sporobolus cryptandrus* Gray. Pena (Duval county) and Screw Bean (Presidio county).
745. *Sporobolus cryptandrus* Gray, var. *flexuosus* Thurber.
746. *Sporobolus cryptandrus* Gray, var. *robustus* Vasey, *n. var.* Culms erect, 6 to 9^{dm} high, stout, simple or with a few erect branches: leaves erect, rigid, scabrous on the margins, 15 to 30^{cm} long, 6^{mm} wide, attenuate; sheaths smooth, except the ciliate margins and hairy ligule; upper sheath long and

inclosing the base of the panicle, which is often 3^{dm} long, strict, dense, pyramidal, the lower sessile branches gradually longer, the lowest 5^{cm} long.—The flowers do not differ from the type. A remarkably robust variety.

747. *Sporobolus cryptandrus* Gray, var. *strictus* Scribner.
748. *Sporobolus depauperatus* Scribner.
749. *Sporobolus Indicus* R. Br. Santa Maria (Cameron county).
750. *Sporobolus junceus* Kunth.
751. *Sporobolus minor* Vasey.
752. *Sporobolus Nealleyi* Vasey, *n. sp.* Culm 12.5 to 20^{cm} high, from strong-rooting rhizomes: leaves 2.5 to 3.5^{cm} long, divaricate, rigid, involute; ligule villous: panicle 2.5 to 3.5^{cm} long, branches few (7 to 10), alternate, short, erect-spreading: spikelets 1.5^{mm} long: upper empty glume equaling the flowering glume; lower one-half as long.—Brazos Santiago.
753. *Sporobolus purpurascens* Hamil.
754. *Sporobolus repens* Presl. Chenate Mountains (Presidio county).
755. *Sporobolus Texanus* Vasey, *n. sp.* Culms about 3^{dm} high, rather rigid below, the upper half occupied by the capillary-branched panicle: leaves linear-lanceolate, 2.5 to 7.5^{cm} long, rigid, acuminate, light green, scabrous above; the sheaths clothed with loose white hairs: panicle half the length of the plant, sheathed at the base, diffusely branched, resembling *S. asperifolius*, but with upper empty glume quite as long as the flowering one, the lower about half as long, both acute.—Screw Bean (Presidio county).
756. *Sporobolus tricholepis* Torr. Chenate Mountains and Limpia cañon (Presidio county).
757. *Sporobolus Virginicus* Kunth.
758. *Sporobolus Wrightii* Vasey.
759. *Epicampes macroura* Benth.
760. *Epicampes rigens* Benth.
761. *Polypogon Monspeliensis* Desf.
762. *Thurberia Arkansana* Benth. Point Isabel.
763. *Agrostis arachnoides* Ell.
764. *Agrostis exarata* Trin.
765. *Agrostis scabra* Willd. Chenate Mountains (Presidio county).
766. *Agrostis verticillata* Vill. Chenate Mountains (Presidio county).
767. *Trisetum Hallii* Scribner, *n. sp.* Very near *T. interruptum*, but with a denser panicle, the empty glumes broader and obtusish, and the flowing glumes with shorter teeth.
768. *Trisetum interruptum* Buckley.
769. *Danthonia spicata* P. Br.
770. *Cynodon Dactylon* Pers. Introduced.
771. *Spartina cynosuroides* Willd.
772. *Spartina gracilis* Trin.
773. *Spartina juncea* Willd.
774. *Spartina stricta* Roth.
775. *Chloris alba* Presl. (*C. elegans* HBK.).
776. *Chloris ciliata* Swartz. Point Isabel.
777. *Chloris cucullata* Bisch. Point Isabel.
778. *Chloris Swartziana* Doell.
779. *Chloris verticillata* Nutt. Point Isabel.
780. *Trichloris pluriflora* Fourn. Point Isabel.
781. *Trichloris verticillata* Fourn.
782. *Gymnopogon racemosus* P. Br.
783. *Schedonnardus Texanus* Steudel. Santa Anna (Coleman county).
784. *Bouteloua aristidoides* Thurber. Chenate Mountains (Presidio county).

785. *Bouteloua breviseta* Vasey, *n. sp.* Culms ascending from a decumbent rooting rhizome, almost woody below, 15 to 30^{cm} high, leafy below: leaves rigid, involute, spreading, pungent, 2.5 to 5^{cm} long, smooth or sparsely ciliate-fringed; ligule ciliate: spikes one to three, distant when more than one, 2.5 to 3.5^{cm} long, closely flowered, very narrow: spikelets 4^{mm} long or less, including the awns: empty glumes unequal, 2 to 2.5^{mm} long, the upper one pungently pointed: flowering glume about 3^{mm} long, including the awns, oblong, three-nerved, three-lobed near the apex, and with three short awns, more or less pubescent on the back: palea nearly as long, narrower, two-nerved: imperfect flower of three short awns on a short pedicel which is hairy tufted at top.—Screw Bean (Presidio county). Apparently growing in sand.
786. *Bouteloua bromoides* Vasey (*B. Humboldtiana* Kunth). Rio Grande City (Starr county).
787. *Bouteloua Burkei* Scribner. Ballinger (Runnels county).
788. *Bouteloua eriopoda* Torr. Devil's River (Val Verde county).
789. *Bouteloua Havardii* Vasey. Chenate Mountains (Presidio county).
790. *Bouteloua hirsuta* Lag.
791. *Bouteloua hirsuta* Lag., var. *major* Vasey.
792. *Bouteloua hirsuta* Lag., var. *minor* Vasey. Pena (Duval county).
793. *Bouteloua oligostachya* Torr. Screw Bean (Presidio county).
794. *Bouteloua oligostachya* Torr., var. *major* Vasey. -
795. *Bouteloua polystachya* Torr. Pena (Duval county).
796. *Bouteloua racemosa* Lag. Ballinger (Runnels county).
797. *Bouteloua ramosa* Scribner. Chenate Mountains (Presidio county).
798. *Bouteloua stricta* Vasey.
799. *Bouteloua Texana* Watson. Point Isabel.
800. *Bouteloua trifida* Thurber. Pena (Duval county).
801. *Eleusine Ægyptiaca* Pers. Introduced.
802. *Eleusine Indica* Gaertn. Introduced.
803. *Leptochloa Domingensis* Link. Hidalgo (Hidalgo county).
804. *Leptochloa mucronata* Kunth.
805. *Leptochloa Nealleyi* Vasey.
806. *Buchloe dactyloides* Engelm.
807. *Pappophorum apertum* Munro. Rio Grande City (Starr county).
808. *Pappophorum laguroideum* Schrad. Rio Grande City (Starr county).
809. *Pappophorum Wrightii* Watson. Chenate Mountains (Presidio county).
810. *Cottea pappophoroides* Kunth.
811. *Cathestechum erectum* Vasey & Hackel.
812. *Scleropogon Karwinskianus* Benth. Pena (Duval county).
813. *Monanthochloe littoralis* Engelm.
814. *Munroa squarrosa* Torr.
815. *Arundo Donax* L. Probably introduced, but wild on the Rio Grande.
816. *Phragmites communis* Trin.
817. *Triodia acuminata* Vasey. Santa Anna (Coleman county) and Chenate Mountains (Presidio county).
818. *Triodia albescens* Vasey.
819. *Triodia ambigua* Vasey. Point Isabel.
820. *Triodia avenacea* HBK. ?
821. *Triodia cuprea* Jacq. Point Isabel.
822. *Triodia eragrostoides* Vasey & Scribner, *n. sp.* Culms 6 to 9^{dm} high, leafy: sheaths longer than the internodes, roughish; ligule short, ciliate-toothed: blade flat, 2 to 3^{dm} long, scabrous, acuminate: panicle large and spreading, 3^{dm} long, the branches slender, rather distant, single or in twos, the lower ones 12.5 to 15^{cm} long, lax-flowered: spikelets short-pedicel, alternate, and

mostly single, five to nine flowered, 5^{mm} long: empty glumes nearly equal, lanceolate-acuminate, one-nerved: flowering glumes 2 to 2.5^{mm} long, three-nerved, oblong, obtuse, emarginate, short-cuspidate, the lateral nerves and midrib pubescent below: palea one-fourth shorter, obtuse, and denticulate.—Florida (*Blodgett*), Texas (*Buckley, Nealley, Reverchon*). A beautiful species, having the aspect of an *Eragrostis*. There are several forms of this verging toward *T. ambigua*.

823. *Triodia grandiflora* Vasey, *n. sp.* Culms 3 to 5^{dm} high: leaves narrow, rigid, plane or conduplicate, 5 to 10^{cm} long, lower with the sheaths softly pubescent: panicle oblong, dense, 3.5 to 6^{cm} long, branches appressed: spikelets 8 to 10^{mm} long: empty glumes unequal, lanceolate, the upper 8^{mm} long, one-nerved, the lower rather shorter, three-nerved: flowering glumes 7 to 8^{mm} long, acute, apex two-lobed, lobes acute, the fissure less than 2^{mm} long, awn about 2^{mm} long, the lateral nerves densely ciliate the entire length, and the midrib below: palea narrow, a third as long as its glume, pubescent on the nerves, abruptly acute. —Chenata Mountains (Presidio county); collected also in Arizona and Chihuahua by Pringle. This has been distributed as *T. avenacea* HBK., but it does not agree with the description and figure given. The spikelets and flowers are larger than in any other *Triodia*.
824. *Triodia mutica* Vasey. (*T. trinerviglutinis* Mun.) Ballinger (Runnels county).
825. *Triodia Nealleyi* Vasey. Chenata Mountains (Presidio county).
826. *Triodia pulchella* Vasey. Chenata Mountains (Presidio county).
827. *Triodia purpurea* Vasey.
828. *Triodia stricta* Vasey.
829. *Triodia Texana* Vasey. Point Isabel.
830. *Diplachne dubia* Benth.
831. *Diplachne fascicularis* P. Br.
832. *Diplachne imbricata* Thurber. Point Isabel.
833. *Diplachne Reverchoni* Vasey.
834. *Diplachne rigida* Vasey.
835. *Eragrostis campestris* Trin (*E. nitida* Chapman).
836. *Eragrostis capillaris* Vasey. Pena (Duval county).
837. *Eragrostis conferta* Trin.
838. *Eragrostis curtipedicellata* Buckl. Hidalgo (Hidalgo county).
839. *Eragrostis lugens* Nees.
840. *Eragrostis major* Host.
841. *Eragrostis Neo-Mexicana* Vasey.
842. *Eragrostis oxylepis* Torr. Point Isabel.
843. *Eragrostis pectinacea* Gray.
844. *Eragrostis Purshii* Schrad. Pena (Duval county).
845. *Eragrostis Purshii* Schrad., var. *diffusa* Vasey (*E. diffusa* Buckl.).
846. *Eragrostis reptans* Nees. Point Isabel.
847. *Eragrostis tenuis* Gray.
848. *Eragrostis tenuis* Gray, var. *Texensis* Vasey, *n. var.* Culm rigid, erect, 75 to 90^{cm} high, leafy, simple: sheaths striate, smoothish or silky-hairy above and at the throat; blade rather rigid, nearly as long as the culm, scabrous and with a few scattered hairs on the upper surface, smooth below, upper sheath inclosing the base of the panicle, which is half the length of the plant, the branches erect-spreading: spikelets three to five-flowered, acute: empty glumes lanceolate, acute, longer than the lowest flowering glume.—Collected by both Reverchon and Nealley.
849. *Eatonia obtusata* Gray.
850. *Eatonia Pennsylvanica* Gray.
851. *Koeleria cristata* Pers.

852. *Melica diffusa* Pursh.
 853. *Uniola gracilis* Michx.
 854. *Uniola latifolia* Michx.
 855. *Uniola paniculata* L. Point Isabel.
 856. *Distichlis maritima* Raf. Chenate Mountains (Presidio county).
 857. *Poa Bigelovii* Vasey & Scribner.
 858. *Poa flexuosa* Muhl.
 859. *Poa Texana* Vasey, *n. sp.* Dioecious (?): rhizome stout, throwing out long stolons which take root at the joints, and from which the leafy culms arise to the height of 15 to 40^{cm}: lower sheaths loose, as long as the internodes or longer; blade 7.5 to 15^{cm} long: panicle narrow, 2.5 to 7.5^{cm} long, the upper part of a few simple sessile spikelets, the lower part with a few few-flowered short appressed branches: spikelets large (10 to 12^{mm}), seven to nine-flowered, compressed, smooth: empty glume, ovate, obtuse: flowering glumes oblong-ovate, three-nerved, 4 to 6^{mm} long, smooth except on the keel.—The specimens are all male.
 860. *Glyceria fluitans* R. Br.
 861. *Glyceria nervata* Trin.
 862. *Festuca nutans* Willd.
 863. *Festuca ovina* L.
 864. *Festuca sciurea* Nutt.
 865. *Festuca tenella* Willd.
 866. *Bromus ciliatus* L. Chenate Mountains (Presidio county).
 867. *Bromus Kalmii* Gray.
 868. *Bromus secalinus* L. Introduced.
 869. *Bromus unioloides* Willd.
 870. *Lolium perenne* L. Introduced.
 871. *Agropyrum glaucum* R. & S.
 872. *Hordeum jubatum* L.
 873. *Hordeum maritimum* With. Introduced.
 874. *Hordeum pratense* Huds.
 875. *Hordeum pusillum* Nutt.
 876. *Elymus Canadensis* L.
 877. *Elymus Canadensis* L., var. *glabriflorus* Vasey.
 878. *Elymus Canadensis* L., var. *minor* Vasey. Santa Anna (Coleman county).
 879. *Elymus Sitanion* Schultz. Chenate Mountains (Presidio county).
 880. *Elymus striatus* Willd.?
 881. *Elymus Virginicus* L.
 882. *Elymus Virginicus* L., var. *minor* Vasey.
 883. *Asprella hystrix* Willd.
 884. *Juniperus occidentalis* Hook. Chisos Mountains (Foley county).
 885. *Juniperus pachyphloea* Torr. Chisos Mountains (Foley county). It is almost impossible to distinguish this species from *J. Mexicana*, and it is very probable that the two should be merged, representing a type which extends over the North Mexican plateau, and into the high lands of Arizona, New Mexico, and western Texas.

The following species were determined by Henry E. Seaton:

886. *Selaginella cuspidata* Link. Chenate Mountains (Presidio county).
 887. *Selaginella lepidophylla* Spring. Chenate Mountains (Presidio county).
 888. *Selaginella rupestris* Spring. Chenate Mountains (Presidio county).
 889. *Gymnogramme hispida* Mett. Chenate Mountains (Presidio county).
 890. *Gymnogramme triangularis* Kaulf. Chenate Mountains (Presidio county).
 891. *Notholaena ferruginea* Hook. Limpia cañon (Presidio county).
 892. *Notholaena Grayi* Day. Chenate Mountains and Limpia cañon (Presidio county).

893. *Notholæna Hookeri* Eaton. Limpia cañon (Presidio county).
894. *Notholæna Nealleyi* Seaton, *n. sp.* Rhizome slender, with narrow black scales: stipe terete, reddish-black, 2.5^{cm} long: frond oblong-lanceolate, contracted below, tripinnatifid, 10 to 12^{cm} long, 3.5^{cm} wide, upper surface (especially when young) white-granular dotted, lower densely coated with a white powder but becoming less so with age: rhachises, like the stipe, white granular and conspicuously clothed with rigid brown hairs: pinnae sessile, nearly opposite, triangular-ovate or ovate-lanceolate, pinnately divided into four to six pairs of sessile pinnatifid obtuse and oblong pinnules, confluent at the apex; margins unchanged but sometimes becoming reflexed: sori brown and copious, in a continuous marginal line.—Chenate Mountains (Presidio county). Most nearly resembling *N. Grayi* Dav.
895. *Notholæna sinuata* Kaulf. Chenate Mountains (Presidio county).
896. *Cheilanthes Eatonii* Baker. Limpia cañon and Chenate Mountains (Presidio county).
897. *Cheilanthes microphylla* Swartz. Limpia cañon (Presidio county).
898. *Cheilanthes tomentosa* Link. Chenate Mountains (Presidio county).
899. *Cheilanthes Wrightii* Hook. Limpia cañon (Presidio county).
900. *Pellaea aspera* Baker. Chenate Mountains (Presidio county).
901. *Pellaea flexuosa* Link. Limpia cañon (Presidio county). These specimens were collected under two numbers, one being typical *P. flexuosa* and the other not typical, but nearer this species than anything else, the rhachises being but little flexuose, if any, and the pinnules mucronulate.
902. *Pellaea ternifolia* Link. Limpia cañon (Presidio county).
903. *Asplenium parvulum* Mart. & Gale. Chenate Mountains (Presidio county).

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LIST OF PLANTS COLLECTED BY DR. EDWARD PALMER IN LOWER CALIFORNIA AND WESTERN MEXICO IN 1890.

By DR. GEO. VASEY and J. N. ROSE.

Dr. Palmer spent some three months in Lower California in the early part of this year, and his work has proved very valuable in adding to our knowledge of the flora of this region. His work has been arduous, owing to the drought and heat, and the few accommodations to be had in this wild and sparsely inhabited country; this, added to his failing health, has made his work doubly trying.

The following are the places visited, with the date of collection and the numbers of the plants:

Places visited.	Date of collection.	Numbers (inclusive).
La Paz, Lower California	Jan. 20 to Feb. 5 ..	1-144
Guaymas, Mexico	Feb. 11	145-147
San Pedro, Martin Island	Feb. 13	148-150
Raza Island	Feb. 12	151-161
Guaymas, Mexico	Feb. 15 to 17	162-176
Santa Rosalia	Feb. 24 to Mar. 3 ..	177-210
Santa Agueda	Mar. 4 to 5	211-264
Santa Rosalia	Mar. 15	265-273

In order that the fullest facility for the determination of the plants of the collection here described might be available, Mr. J. N. Rose, Assistant Botanist, spent some time at Cambridge, Mass., in investigating and comparing the plants with those contained in the herbarium of Harvard College. We gladly acknowledge the generous help of various botanists in the determination of difficult species, and especially that of Dr. Sereno Watson for his aid in studying many of the type plants in the Cambridge herbarium.

PLANTS COLLECTED AT LA PAZ, LOWER CALIFORNIA.¹

Great interest was felt in Dr. Palmer's trip to La Paz and vicinity this past winter and his rich collection has added much to our knowl-

¹ Read before the A. A. A. S. at Indianapolis, August 26, 1890.

edge of the flora of that region. Dr. Palmer left San Francisco December 25, by steamer, in company with Mr. T. S. Brandegee, who, landing at Magdalena Bay, proceeded overland to Cape St. Lucas, while Dr. Palmer continued to Guaymas, Mexico, and from there returned to La Paz. In about two weeks, from January 20 to February 5, one hundred and seventeen species were collected. Among these are two new genera, fourteen new species, and many more very rare ones. The southern half of the Californian peninsula has been almost unknown botanically until the last two seasons, when, through the energetic labors of Dr. Palmer and Mr. Brandegee, many new and rare species have been brought to the knowledge of science. The few collections that have been previously made in this region are well known to botanists. The first collection was made by Mr. R. B. Hinds on the voyage of H. M. S. *Sulphur* in 1839. Only about one hundred and fifty species in all were collected, the larger part being new. They were from Lower California, at San Quentin, San Bartolomé, Bay of Magdalena, and Cape St. Lucas. Of this number nineteen were collected at Cape St. Lucas, of which fifteen were described as new species.

No further collections were made in this region until 1859-'60, when Mr. L. J. Xantus spent several months at Cape St. Lucas making a collection of one hundred and twenty-two species, nineteen¹ of which Dr. Gray (Proc. Amer. Acad. V.) described as new. Quite a number of the others have since been separated from the species to which they were referred and are described as new. W. F. Fisher got a few things at the Cape in 1876, and Mr. W. H. Townsend in 1889. Major Rich² is the first person of whom we have any record who collected at La Paz. Three other valuable collections have been made in the central part of the peninsula, which ought to be mentioned here, on account of the numerous new species they contain (of which Dr. Palmer has re-collected many)—namely: the collections of Dr. Palmer in 1887, at Los Angeles Bay, and at Lagoon Head in 1889, and that of Mr. Brandegee in 1889, from Magdalena Bay to San Quentin. Of the one hundred and fifty species collected by Mr. Hinds, twenty-five were recollected and ten of the fifteen new species collected by him at Cape St. Lucas; forty-two of the one hundred and twenty-two species of Xantus were recollected, twelve of which were of the new ones of this collection; sixty-three of the species collected by Dr. Palmer at Guaymas and Los Angeles Bay were recollected, eight being of the new species described by Mr. Watson from that collection; seventy-six of the species were collected by Mr. Brandegee, six being his new species. Of the species collected fifty-six extend into the United States, mostly into the desert region of southern California and Arizona; seventy-six have been collected in Mexico (mostly from the western part); ten extend into Central America and eight are in South America.

¹ One was described by Dr. Englemann.

² Collected *Lycium Richii* Gray.

The following table will show the above facts in a condensed form :

	Number of species.	New species.	Number of genera.	Hinds. ¹	Xantus. ²	Watson. ³	Brandegee. ⁴	Lower California. ⁵	United States. ⁶	Mexico. ⁷	Central America. ⁸	South America. ⁹
Papaveraceæ	1		1	1	1	1	1	1	1	1	1	
Cruciferae	2		2		1	1	2	2				
Capparidaceæ	2		2			(2?) 1	(2?) 1	2	2	(2?) 1	1?	1
Violaceæ	1		1	1	1							
Polygalaceæ	1		1			1		1	1	1		
Caryophyllaceæ	1		1	1	1	1		1	1	1		
Portulacaceæ	1		1			1	1	1	1	1	1	1
Malvaceæ	6	1	4		1	4	5	5	1	1	1	1
Sterculiaceæ	2	1	2		1	1	1	1	1	1	1	1
Malpighiaceæ	2		2	1	1	2	2	2	1	2		
Zygophyllaceæ	1		1				1	1	1	1		
Burseraceæ	1		1		1	1	1	1	1	1		
Oleaceæ	1		1				1	1	1			
Rhamnaceæ	1		1		1			1	1	1		
Sapindaceæ	2	1	1	1?	2?							
Leguminosæ	19	2	13	1	5	10	9	12	8	12		
Loasaceæ	1		1	1		1	1	1				
Turneraceæ	1		1					1	1	1		
Cucurbitaceæ	3		3				1	2		1	1	1
Cactaceæ	1		1									
Ficoideæ	1		1			1		1	1	1	1	1
Rubiaceæ	3	2	1	1	1		1	1				
Compositæ	20	2	16	(8?) 7	10	8	(14?) 13	12	8	7		
Apocynaceæ	1		1	1	1	1	1	1	1	1	1	1
Asclepiadaceæ	1		1		1	1	1	1	1	1		
Polemoniaceæ	1		1							1	1	
Hydrophyllaceæ	1		1				1	1		1		
Borraginaceæ	5		4		1	(2?) 1	(2?) 1	3	(3?) 2	(3?) 2		
Convolvulaceæ	5		4	1	1	3	1	2	1	3	?	1?
Solanaceæ	6	1	4	1	1	2	2	4?	4?	3?		
Serophulariaceæ	2		2	1		2	1	1	2	2		
Bignoniaceæ	1		1				1	1	1	1		
Acanthaceæ	7	2	6	1	2	2	5	5	2	4		
Verbenaceæ	2		1			1	1	1		1		
Labiatae	3		2	1	2	1		1	1	1	1	
Amarantaceæ	1		1				1	1				
Phytolaccaceæ	1		1	1	1	1	1	1		1		
Loranthaceæ	1		1									
Euphorbiaceæ	15	1	5	4	2	6	10	6	6	8		
Salicaceæ	1		1						1	1		
Palmeæ	1		1		1	1				1		
Gramineæ	14	1	13		2	8	8	9	6	10	1	1
Total	143	14	110	25	43	63	76	88	57	77	10	8

¹ Hind's collection as reported by Bentham in "Botany of the Sulphur."

² Xantus's collection as reported by Dr. Gray in Proc. Amer. Acad. Vol. V.

³ Palmer's 1887 collection as reported by Mr. Watson in Proc. Amer. Acad. Vol. XXIV.

⁴ Brandegee's 1889 collection as reported by himself in Proc. Cal. Acad. 2d Ser. Vol. II.

⁵ Plants of Central and Northern California.

⁶ Plants extending into the United States.

⁷ Plants extending into Mexico.

⁸ Plants extending into Central America.

⁹ Plants extending into South America.

PAPAVERACEÆ.

Argemone Mexicana L. Called "Cardo"; very common in waste places. **No. 55.**

CRUCIFERÆ.

Cardamine Palmeri Watson. Proc. Amer. Acad. XXIV. 38. Only a few plants found growing in shade on mesas. Flowers white. **No. 103.**

Lyrocarpa Xanti Brandegee. Proc. Cal. Acad. 2nd Ser. II. 127. This is undoubtedly the same that Xantus (No. 2) got at Cape St. Lucas. A very common plant on lowlands in shade of trees and shrubs. Flowers, "light mauve." **No. 73.**

CAPPARIDACEÆ.

Wislizenia refracta Engelm. A common plant, 2 to 3 feet high, in alkali soil, near the sea-beach. The plant has a fetid odor. Our plant seems to belong to this species, having the trifoliate leaves and small fruit. It seems distinct from the type of *W. Palmeri*, but recent specimens referred to that species by Watson and Brandegee seem to be intermediate forms uniting these species. Mr. Brandegee in a recent note (Proc. Cal. Acad. 2nd Ser. II. 128) says he thinks the distinction very slight. **No. 88.**

Atamisquea emarginata Miers. A small tree or bush 6 to 8 feet high, with few stems, but with many short lateral branches, very brittle and consequently very difficult to make into specimens. The flowers are white and "as finely scented as orange flowers." It was found contiguous to the ocean, on sandy mesas, just coming into bloom. **No. 58.**

VIOLACEÆ.

Ionidium fruticosum Benth. Bot. Sulph. 7. This plant is quite variable in its leaves. The lower part of the stem is often woody, developing considerable cork and seeming a true perennial. Our specimens seem to cover both the type and Gray's variety *dentata* made from Xantus's No. 4. Found abundantly under shade of trees. **No. 84.**

POLYGALACEÆ.

Krameria canescens Gray, var. *paucifolia* Rose, n. var. Slightly pubescent, with weak spreading branches: leaves very small (1 to 2 lines long) and distant: sepals (3 to 4 lines long) broad, merely acute.

Dr. Palmer collected at Guaymas and Los Angeles Bay, 1887, a plant much like this in habit and foliage, but with the narrower sepals and spatulate petals of the type and thus representing an intermediate form. It is proper to state here that Mr. Brandegee thinks the plant should go into *K. bicolor* Watson. While the plant has the petals and larger fruit of this species, it has different pubescence, smaller leaves, broader sepals, and smaller bracts to the pedicels. The following is Dr. Palmer's note: "Found upon mesas and edges of ravines among other plants, at the base of which they grow, and by which the weak stems are supported, making by the many interlacing branches a thick mass, which appears like a parasite. Not seen by itself. Found but one plant with seed; the seed-pods had sprouted upon the plant, forming three rather fleshy leaves like the leaves of the plant and of a bronze color. Flowers mauve."

No. 4.

CARYOPHYLLACEÆ.

Drymaria crassifolia Benth. Bot. Sulph. 14. Abundant on sandy beach. No. 6 of Xantus. First collected by Hinds at Cape St. Lucas. **No. 142.**

PORTULACACEÆ.

Portulaca pilosa L. (?). Probably this species, but material insufficient for perfect determination. Common on beach and under trees contiguous to ocean. It is very tenacious of life, specimens before me having been in press for almost three months and still nearly as green as when collected. **No. 140.**

MALVACEÆ.

Sphæralcea Californica Rose, n. sp. Two to 4 and sometimes even 10 to 12 feet high, densely stellate-pubescent, becoming somewhat glabrate below: leaves triangular-oblong, $1\frac{1}{2}$ to $2\frac{1}{2}$ inches long, cordate or truncate at base, more or less 3-lobed, crenately-toothed, densely stellate-pubescent: inflorescence open panicle; flowers orange-yellow: calyx 2 to $3\frac{1}{2}$ lines long, its lobes ovate-acuminate: petals 5 lines long, obovate: capsules small, depressed; carpels

12 to 16, strongly reticulated below, the sterile part a mere incurved acutish tip; ovule and seed one.

S. Coulteri Brandege. Proc. Cal. Acad. 2nd Ser. II. 135.

One of the most common plants of Lower California. Dr. Palmer found it in the ravines and sandy spots contiguous to the beach at La Paz, growing 2 to 3 feet high. Mr. Brandege writes me that in moist places it is 10 to 12 feet high. It is a rough, homely plant, avoided by all grazing animals. In habit and pubescence the plant resembles Xantus's (No. 10) plant from Cape St. Lucas, but the carpels are entirely different, in fact they are almost the exact counterpart of those of *S. Coulteri* Gr. This strong similarity has led Mr. Brandege into the error of referring his specimens of last year to this species. While the carpels are so similar and like no other *Spharalcea*, still there seems a slight difference. *S. Coulteri* Gr. is less pubescent and the terminal part (wrongly called the "horizontal projection at base" by Watson and Brandege) is very broad and obtuse. *S. Californica* is said by Mr. Brandege to be an annual, but appears to be biennial or perhaps perennial. *S. Coulteri* Gr., originally described as perennial, is clearly an annual. It is also very different in habit; *S. Coulteri* Gr., is either procumbent or with branches ascending, while *S. Californica* is tall and erect. The pubescence is very different as well as the shape and toothing of the leaves, and the size and color of the flowers. **No. 18.**

Horsfordia Palmeri Watson. Proc. Amer. Acad. XXIV. 40. Six feet high, with single upright stem and many lateral branches: lower leaves 4 to 5 inches long. Common on sandy mesas, called "Mariola," and much used as a remedy in female diseases. **No. 96.**

Horsfordia rotundifolia Watson. Proc. Amer. Acad. XXIV. 41. Found sparingly on a stony ridge. **No. 117.**

Sida Xanti Gray. Proc. Amer. Acad. XXII. 296. Collected by Xantus 1859-'60, but not described until three years ago. The flowers are described as "apparently white but perhaps yellow." Dr. Palmer speaks of the "golden-colored bloom," but in the plants before us there is a purplish tinge. The few plants obtained are from a stony ridge. It grows 3 to 4 feet high, with two or three slender stems from the base and few lateral branches. **No. 27.**

Abutilon Palmeri Gray. **No. 90.**

Abutilon incanum Don. A plant 3 or 4 feet high, growing in sandy gulches among shrubs. **No. 120.**

STERCULIACEÆ.

Hermannia Pa'meri Rose n. sp. Stems perennial, weak, the long slender branches supported by other plants, densely stellate-pubescent: leaves deltoid in outline, cordate at base, 6 to 12 lines long, dentate, on petioles 4 to 8 lines long: peduncles slender, 6 to 15 lines long, 1 to 2-flowered, articulated at the upper bract, becoming reflexed: calyx 3 to 4 lines long, deeply cleft into lanceolate acute lobes, not enlarged in fruit: corolla golden yellow; petals 4 to 5 lines long, orbicular, cuneate at base, with an abrupt tip, spreading or reflexed: stamens 5; filaments very short; anthers erect, free but connivent as in *Solanum*: styles cohering: capsule 6 lines long, oblong, the dorsal crest of each capsule armed with long glochidiate spines; seeds 5 to 7 in each cell, somewhat incurved, the hilum end somewhat pointed, the surface dull with irregular depressions. Grows under shade of bushes on sandy mesas. Also collected at Todos Santos by Mr. T. S. Brandege. **No. 29.**

Melochia tomentosa L. An upright growing shrubby plant, about 6 feet high, on mesas. Collected by Xantus (No. 13), and also at Magdalena Bay, etc., by Brandege. **No. 121.**

MALPIGHIACEÆ.

Galphimia angustifolia Benth., var. *oblongifolia* Gray. Small plants under shade of trees, bloom yellow. This is the same as the more recent *G. linifolia* of Gray,

which Hemsley in Biol. Centr.-Amer. has retained, reducing Bentham's name to a synonym. Xantus (No. 15) collected the typical form. **No. 109.**

Janusia Californica Benth. Bot. Sulph. 8. Plant 4 to 6 feet high; hangs for support on other plants; along arroyos. Flowers yellow. **No. 42.**

ZYGOPHYLLACEÆ.

Larrea Mexicana Moric. Called "gobernadora," and is used in hot baths for the cure of rheumatism. **No. 54.**

BURSERACEÆ.

Bursera microphylla Gray. "Torote," a low tree 10 to 15 feet high, a foot or more in diameter, with a much-branching top. The bark is used for dyeing and tanning and is largely shipped to England. An injection made from the bark is used for gonorrhea, and a drink prepared from the gum is taken for the same disease. **No. 64.**

OLACINÆ.

Schœpfia Californica Brandegee. Proc. Cal. Acad. 2nd Ser. II. 139. **No. 143.**

RHAMNACEÆ.

Karwinakia Humboldtiana Zucc. Called "Cacachila;" a large bush 8 to 12 feet high. A decoction of the plant is used in common fever. **No. 67.**

SAPINDACEÆ.

Cardiospermum Palmeri Vasey & Rose. Proc. Nat. Mus. XIII. 147. A climbing plant not much seen. One plant only, found in bloom on the bank of a ravine. A part of the type. **No. 68.**

Cardiospermum tortuosum Benth. ? About 4 feet high, puberulent becoming glabrate and thorny; thorns 6 to 12 lines long, 2 to 3 forked at tip. Flowers few, white. Perhaps this species, but more glabrous and thorny than Mr. Bentham's form; it answers better Xantus's No. 19 referred as "*Cardiospermum* ? sp. nov." by Dr. Gray. **No. 2.**

LEGUMINOSÆ.

Coursetia glandulosa Gray. Proc. Amer. Acad. V. 156. The specimen of Xantus (No. 25) upon which this species was founded was merely in flower and it was doubtfully referred to this genus. Our plant has smaller leaves than the type and is much like larger-leaved forms of *C. microphylla* Gray, which perhaps will be referred to this species. A small tree, 15 feet high, with loose growing branches. "Bloom, lower part light yellow, upper white." Found in low places near a dry creek. **No. 38.**

Dalea chrysorrhiza Gray. Proc. Amer. Acad. V. 156. The type was first collected by Xantus (No. 22) at Cape St. Lucas; not collected since until last season, by T. S. Brandegee, at Cardon Grande. It is a trailing plant on sandy bottoms. Flowers "mauve-colored." **No. 71.**

Dalea maritima Brandegee *ined.* Very common on sandy beach near the ocean. **No. 79.**

Dalea Emoryi Gray. The plants grow on sandy beaches in masses covering very large spaces. The stems are procumbent and with interlacing branches hide the ground. They have a white appearance and at a distance look like dry hay. Occasionally a glabrous plant is found growing with others, a fact also noted by Mr. Brandegee. **No. 3.**

Cracca Edwardsii Gray. Found growing in shade of bushes. "Bloom, cream-colored; on the upper part red striped, turns reddish by age." **No. 51.**

- Æschynomene nivea*** Brandege. Proc. Cal. Acad. 2nd Ser. II. 150. Generally with one central stem or sometimes with a few lateral branches. "Bloom, sulphur color." Grows on stony ridges. Only collected before by Mr. Brandege at Purisima, 1889. **No. 110.**
- Phaseolus filifolia*** Benth. Bot. Sulph. 13. Small climbing plant along ravines. Flowers rose-colored. This is No. 13 of Xantus. **No. 82.**
- Cæsalpinia pannosa*** Brandege. Proc. Cal. Acad. 2nd. Ser. II. 150. A very common shrub with two or three main branches. **No. 114.**
- Cæsalpinia*** n. sp. A compact shrub 4 feet high, brown bark, younger parts somewhat pubescent and with stipitate glands: leaves small (the petiole and rachis with stipitate glands) with one pair of pinnae; leaflets 5 pairs, excentric, oblong, 2 to 4 lines long: racemes short-pedunculate, 1 to 3 inches long; bracts ovate, obtus-, lacinate, caducous: pedicels slender, jointed near the summit: sepals 3 lines long, purple ("bronzed"), covered with stipitate glands: petals 5 to 6 lines long, yellow, more or less glandular: stamens somewhat villous: pods not seen.—On stony ridges. An abundant bloomer with fragrant flowers "as sweet as apple blossoms." Collected by Palmer in 1887 but not reported in Mr. Watson's list. **No. 95.**
- Hæmatoxylon boreale*** Watson. Proc. Amer. Acad. XXI. 426. "Loose, thorny shrub, 8 to 10 feet high; has in the young leaves a peculiar bronze color; the older leaves fall when the new ones appear. The wood yields a dye." **No. 48.**
- Cassia Covesii*** Gray. Called "Oyason;" the roots and stems are used as a blood purifier, and by the common people in the making of poultices and in hot baths for the cure of certain diseases. **No. 52.**
- Parkinsonia Torreyana*** Watson. Called "Palo Verde." A low tree with branching top. "Just coming into flower" (Feb. 1). Perhaps this is the same plant collected by Mr. Brandege in 1889. **No. 112.**
- Acacia Wrightii*** Benth. A thorny shrub 6 feet high, with few stems. "The flowers have a pleasant honey-like aroma." **No. 94.**
- Acacia Farnesiana*** Willd. Called "Vinorama." A small tree with loose branches. The outer bark when fresh is used to cure headache, and the pods were once used to make ink. "The flower very aromatic, honey-like." It is No. 34 of Xantus. **No. 60.**
- Acacia flexicaulis***¹ Benth. Stamens numerous, united into a tube longer than the corolla tube; pods curved, rough, black, an inch broad, 3 inches long. This is called "Palo fierro" (iron wood), and is a very useful plant. Although often a small tree, Dr. Palmer only found it at La Paz as a low thorny bush with rough scraggy branches. Flowers white. **No. 86.**
- Lysiloma candida*** Brandege. Proc. Cal. Acad. 2nd Ser. II. 153. Called "Palo blanco" (white wood). The bark is used for tanning purposes, while the wood is used in many ways. Only small trees, 12 to 15 feet high and 6 inches in diameter, were seen. Grows along arroyos. Flowers white. **No. 80.**
- Calliandra eriophylla*** Benth. A small plant 2 feet high with compact top. The stamens are white tipped with red. On mesas. Not common. **No. 72.**
- Calliandra***, sp. Belonging to Bentham's series *Nitida*, near *C. Californica*, or it may be *C. Cumingii*. The pinnae are always 6 pairs, and leaflets about 20 pairs; the leaflets 2 to 3 lines long, midvein eccentric, a little pubescent, acute: peduncle $1\frac{1}{2}$ to 2 inches long, with numerous flowers: calyx less than a line long: petals 3 lines long: pods $2\frac{1}{2}$ to $3\frac{1}{2}$ inches long, considerably tapering at base, with thick margins, and a little puberulent. Only a single specimen collected, growing in a garden at La Paz. It is called "Tabardillo," by which name yellow fever was known to the Indians. The root of this plant is now used by the people of this region as a remedy for fevers. **No. 22.**
- Pithecolobium dulce*** Benth. A large wide-spreading tree. Cultivated in most places in Mexico for its edible fruit, useful wood, and tan-bark. **No. 14.**

¹This is *Pithecolobium Texense* Coulter Cont. Nat. Herb. I. 37.

LOASACEÆ.

Mentzelia adhærens Benth. Bot. Sulph. 15. Seen but sparingly; leaves stick to everything; flowers open at night. No. 57.

TURNERACEÆ.

Turnera diffusa Willd., var. **aphrodisiaca** Urban. Jahrb. Bot. Gart. Berl. II. 127.

Dr. Palmer writes of this plant as follows: "This plant is widely known in this locality under the name Damiana. It has a wide medical reputation as a stimulant in exhausted vitality and for the cure of syphilis, and as a blood purifier used in the form of hot teas. All over the peninsula where it can be had it is used as a substitute for China tea; it has a pleasant flavor unlike any other plant. It is made into preparations with spirits and sold by druggists for its strengthening qualities. It refreshes one greatly when fatigued, alleviates nervous diseases, cures colic, and is an efficacious diuretic. It is put up at La Paz in large quantities. Flowers close at night." No. 11.

CUCURBITACEÆ.

Momordica Charantia L. Cultivated for its fruit, which is fed to tame birds. No. 59.

Maximowiczia (f). A trailing plant among rocks near sea-beach. The leaves are very hispid both above and below with stout appressed hairs. No. 102.

Echinocystis minima Watson. A common plant in creek bottoms and mesas; climbs over bushes. The leaves are deeply lobed, sometimes almost to the base. No. 65.

CACTACEÆ.

Mamillaria, sp. One foot to 18 inches high, with many bright crimson flowers; very fleshy scarlet fruit of rounded form. Perhaps a new species. No. 139.

FICOIDEÆ.

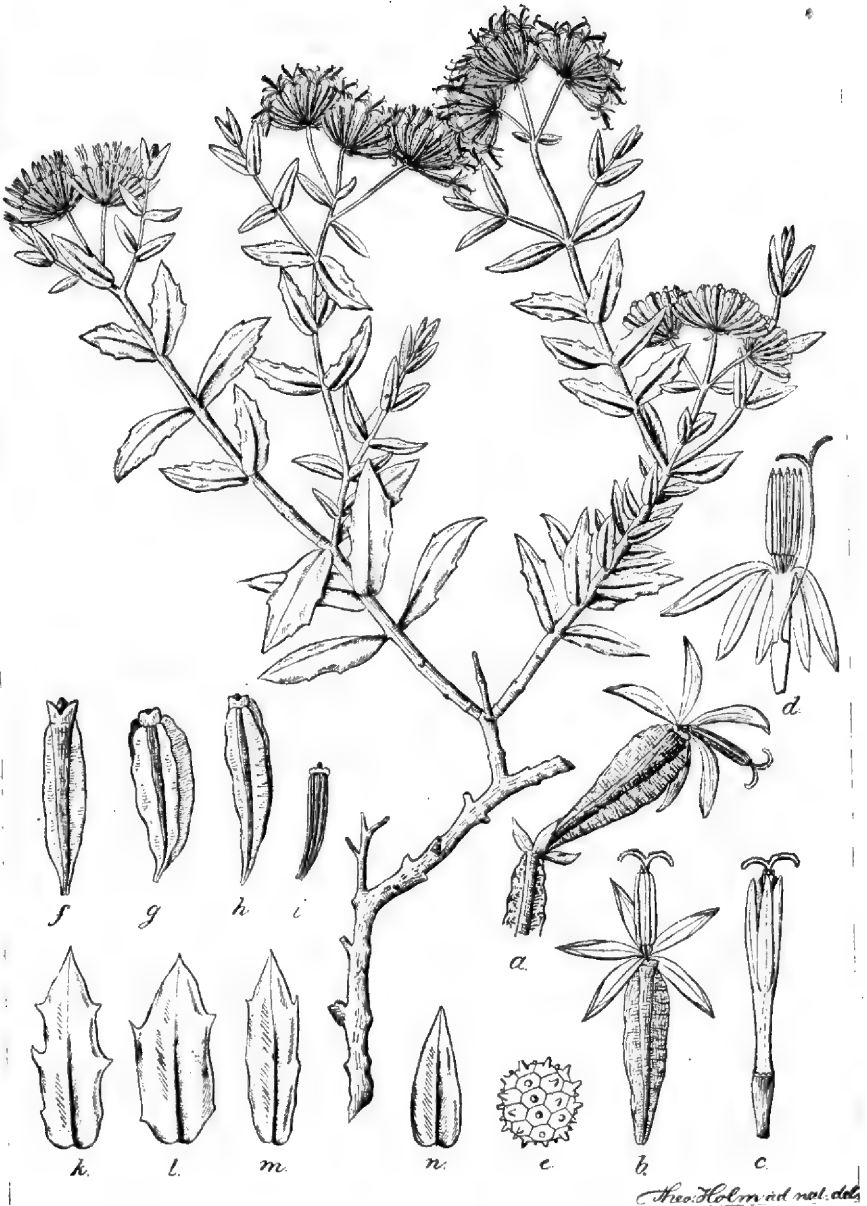
Mollugo verticillata L. Only three small plants were found, growing under bushes on mesas. The plants are small, with linear leaves. No. 36.

RUBIACEÆ.

Houstonia asperuloides Gray. Proc. Amer. Acad. V. 158. This species is quite variable. A good figure (No. 13) appears in Botany of the Sulphur. The corolla tube is sometimes slender filiform, as figured, in other specimens broader, gradually running into the calyx. Some (No. 31^a) are quite glabrous, with long filiform pedicels and slender branches; others are somewhat granulate, with capsules short and sessile or glomerate in the axils and the whole plant depressed. "Corolla pink." Collected first by Hinds of the Sulphur in 1837 and by Xantus (No. 43) in 1859-'60, both at Cape St. Lucas, and probably by Mr. Brandegee, 1889, at Magdalena Bay. Common on sandy plains and mesas. No. 24 (in part), 31^a.

Houstonia Brandegeana Rose, n. sp. Near the last but more erect, with slender branches: pedicels long and slender, sometimes 1½ inches long: calyx ½ line long, with short erect obtuse lobes: corolla 3 lines long, with slender tube two or three times the length of the calyx, with broad funnel-form throat and obtuse lobes; the throat yellowish green; the limb violet: capsule globose (½ line long), not tapering into a long, narrow base.—Habitat the same as the above. No. 31 and 24^a.

Houstonia arenaria Rose, n. sp. A taller species, much branching, glabrous: leaves lanceolate, 9 to 15 lines long by 2 to 3 lines broad; stipules lacinate: flowers numerous, either sessile in the forks, or along the rachis, or on filiform pedicels, 3 to 4 lines long: calyx-tube with small obtusish lobes: corolla "pure white,"



COULTERELLA, nov. gen.

tinged with pink in drying, $1\frac{1}{2}$ lines long, with slender tube: capsule obtuse at base, free from calyx merely at the top, emarginate at apex; seeds 4, minutely reticulated. —Growing on sand. A very rare and well-marked species.
No. 28.

COMPOSITÆ.

Hofmeisteria fasciculata Walp. Rep. VI. 106. Collected by Hinds, Xantus (No. 46), and Brandegee. It is illustrated in Bot. Sulph under Helogyne. Very abundant in crevices of rocky bluffs facing the ocean. Whole plant light green, about a foot high, leaves very fleshy, flowers rose-colored. **No. 137.**

Aplopappus arenarius Benth. It is undoubtedly a true Aplopappus and probably Bentham's species from Cape St. Lucas. It does not appear to be Xantus's species, referred here by Gray. The *A. spinulosus* of Brandegee, from San Gregoria, probably belongs with it. The style tips are deltoid and the akenes are turbinate, and 8 to 10-ribbed. Found on the mesas and exposed places. A compact plant and an abundant bloomer. **No. 17.**

Coulterella,¹ n. gen. (Plate I.) Heads 1-flowered (rarely 2), in cymose, glomerate clusters. Flowers tubular, fertile. Proper involucre tubular, of three united bracts, 3-toothed at apex, winged in fruit, inclosing the ovary and corolla tube and permanently investing the akene. Corolla regular, with narrow proper tube and deeply cut into lanceolate divisions longer than the tube. Stamens inserted high up in the tube; anthers wholly exerted, sagittate at base. Style branches elongated and obtuse, papillo-e. Akene linear-cuneate and terete; pappus a minute annular crown or obsolete. —A compact shrub, glabrous and succulent. Leaves opposite, entire or dentate, sessile. Corolla yellow. Probably belonging to the tribe *Helianthoideæ*, sub-tribe *Lagasceæ*, but possibly of the tribe *Inuloideæ*, and a relationship has been suggested with Gray's little *Dimeresia* of Oregon. The opposite leaves, broad style-branches and merely sagittate anthers seem to more properly refer it to the former tribe. Named in honor of John M. Coulter, editor of Botanical Gazette and author of numerous botanical works.

Coulterella capitata, n. sp. A shrub with many branches, forming a large bush 4 feet high: leaves very fleshy, about an inch long, with few spiny dentations: the glomerate clusters loose, 6 to 25-flowered, each head in the axil of a small setaceous bract: corolla lobes 3-nerved, 2 lines long: involucre in fruit 3 to 4 lines long, spongy, 3-angled or winged: akenes $1\frac{1}{2}$ lines long: the plant has a strong aroma of the oil of lemon. —Rare, on a sandy beach near the ocean.
No. 136.

EXPLANATION TO PLATE I.

a. A head with the base of the receptacle, and three of the bracts. b. A flower. c. A flower; the involucre removed. d. A flower laid open, and the style withdrawn from the anther-tube. e. A pollen-grain. f. Involucre of a young flower. g. Four-winged involucre of an older flower. h. Three-winged involucre of an older flower. i. The achenium. k, l, m, n. Four leaves showing difference in form.

Parthenice mollis Gray *vide* Brandegee. **No. 66.**

Franseria tenuifolia Gray. "Instafiata;" a remedy for fever and ague. Collected by Xantus (No. 55). **No. 53.**

Viguiera deltoidea Gray. Proc. Amer. Acad. V. 161. Dr. Palmer has collected this species again, near the original station. He says "its several stems form a compact, shrubby plant, 8 to 10 feet high, blooming abundantly. It is very common along gulleys and among trees and shrubs on the mesas. This plant is much taller than was originally supposed. The leaves are either alternate

¹Read before the Biological Society of Washington, D. C., May 31, 1890.

- or opposite, even to the top. Very near to this is var. *Parishii* (*V. Parishii* Greene), of more northern range; the southern form passes into the type. **No. 30.**
- Viguiera tomentosa* Gray.** Proc. Amer. Acad. V. 161. This is a very rare species in herbaria and is only known before from the collection of Xantus (1859-60), from the vicinity of Cape St. Lucas. An upright growing plant with several woody stems. It has a large, loosely hanging top; a very free bloomer. Common on arroyos and on mesas. **No. 83.**
- Encelia Palmeri* Vasey & Rose.** Proc. Nat. Mus. IX. 535. These specimens have somewhat smaller leaves, either cordate or cuneate at base; the akenes obovate. Dr. Palmer says it is a very common plant here. It is 3 feet high, in compact masses, and is a very showy plant. It has been collected by Mr. Brandegee at Magdalena Island and San Gregoria. **No. 15.**
- Encelia farinosa* Gray.** Only a single plant collected. It is called "Incienso," because of the gum which the woody part yields being used by the priests in early times for incense. It is amber-colored and has a pleasant aroma. Not before collected so far south. Mr. Brandegee has referred here his *E. radiana*. **No. 50.**
- Bidens Xantiana* Rose, n. sp.** Stems terete, a foot to 15 inches high, slender and somewhat spreading at base, glabrous throughout: leaves much shorter than internodes, opposite, bipinnate with short linear segments: head on long peduncles: the outer involucre of short linear bracts, the inner longer, ovate and acute: disk about 3 lines high; rays 8, about 5 lines long, styliiferous: akenes 2-awned.—We name this species for Xantus, who collected here in 1859-60. It seems nearest *B. angustissima* H. B. K., but differs in its terete stem, shorter leaflets, and glabrous involucre. It differs from most *Bidens* in its styliiferous rays. Only a single plant seen; this grew in a shady arroyo. **No. 5.**
- Leptosyne parthenioides*, var. *dissecta* Watson.** Proc. Amer. Acad. XXIV. 56. Very similar in habit to this form. It is *L. heterocarpa* Gray, and if this species is not to be kept distinct, as is held by Mr. Watson and Mr. Brandegee, it should be referred to this variety and not to the species proper, where it is assigned by these authors. The akenes are smaller than in the species proper; the dissected wings thick and corky, and the awn retrorsely hispid; this was noticed by Mr. Brandegee, but in Bentham's figure (Bot. Sulphurt. 16) they are upwardly hispid. No. 62 of Xantus. Found in only a few places in the shade of trees. **No. 19.**
- Perityle Emoryi* Torr.** A common plant in sandy, alkaline plains, near the ocean. Very succulent plant; difficult to dry. **No. 78.**
- Perityle microglossa* Benth.** Grows abundantly under shade of trees. Collected by Xantus (No. 48) at Cape St. Lucas, 1856-60. **No. 92.**
- Palafoxia arenaria* Brandegee.** Proc. Cal. Acad. 2nd series, II. 178. Found very abundantly and just coming into bloom, upon a sandy beach near the ocean. **No. 100.**
- Porophyllum gracile* Benth.** Dr. Palmer gives the common name "Yerba-del-venado;" it is used by the country people in preparing a tea to relieve pain in the stomach. No. 64 of Xantus. **No. 8.**
- Dysodia speciosa* Gray.** Proc. Amer. Acad. V. 163. Rather plentiful, growing near and supporting itself upon other plants. Its bright amber flowers and strong bergamot aroma make it a very attractive plant. No. 65 of Xantus. **No. 32.**
- Pectis Palmeri* Watson.** Proc. Amer. Acad. XXIV. 58. Stony ridge. Very rare. Only known before from Palmer's 1887 collection from Guaymas, Mexico. **No. 113.**
- Pectis multisecta* Benth.** A very common plant on sandy mesas, bright, with numerous yellow flowers. **No. 23.**
- Bebbia atriplicifolia* Greene.** Very common; 6 to 8 feet high, with many stems, which hang loosely over other plants; flowers orange-yellow, with pleasant

odor. First collected by Xantus (No. 47) and recently by Brandegee. This southern form seems distinct from *B. juncea*. No. 108.

Trixis angustifolia DC. About 2 feet high. No. 7.

APOCYNACEÆ.

Vallesia dichotoma Ruiz & Pavon. A shrubby plant, 10 to 12 feet high, in alkali soil near sea-beach. Fruit white, "flowers white," drying orange. No. 89

ASCLEPIADACEÆ.

Asclepias subulata Decaisne. "Called Yamete." Only collected in flower. Xantus (No. 91) collected it in fruit. No. 56.

POLEMONIACEÆ.

Leselia ciliata L. Only a few poor specimens seen on the edge of ravine, in sandy soil under bushes. Corolla blue. The leaves are not so spinosely toothed as in the specimens collected by Palmer in 1885. So far as known it has not before been reported from Lower California and is rarely collected in Mexico and Central America. No. 9.

HYDROPHYLLACEÆ.

Phacelia scariosa Brandegee. Proc. Cal. Acad. 2nd Ser. II. 185. Grows on sandy beaches near the ocean. A very handsome species. No. 105.

BORRAGINACEÆ.

Cordia sp. "Very much like *C. cylindristachya*, also near *C. Palmeri* but leaves too crenate." S. Watson. No. 39.

Heliotropium parvifolium DC. Three to four feet high; flowers yellowish-white. In low creek bottoms in shade of trees. Not common. No. 45.

Bourreria Sonoræ Watson. Proc. Amer. Acad. XXIV. 62. A bush 10 to 12 feet high, with a few upright and many lateral stems. The large black fruit edible and of the taste of hawthorn. No. 113.

Krynitzkia micromeres Gray? This differs somewhat from the northern forms of this species, but it seems to be the same as Xantus's No. 76, made a part of this species by Gray. No. 111.

Krynitzkia leiocarpa F. & M. Perhaps this species, but material not sufficient. No. 26.

CONVOLVULACEÆ.

Ipomœa bracteata Cav. No. 69.

Jacquemontia abutiloides Benth. Common along ravines and among thick bushes on mesas, climbing about 5 feet high. No. 35.

Evolvulus linifolius L. Only a few plants seen. The leaves are very narrow and the flowers very small, about 2 lines in diameter. The specimens of Palmer's from Guaymas have much larger flowers (over 5 lines long) and seem to approach *E. Arizonicus*. Xantus collected *E. alsinoides* at Cape St. Lucas, but this species has much broader leaves. No. 1.

Cuscuta Palmeri Watson. Proc. Amer. Acad. XXIV. 64. Parasitic on *Euphorbia* sp.; found on sandy mesas. No. 90.

Cuscuta Americana L.? Perhaps new; the bracts are large and fimbriate. The seeds 4, etc. No. 141.

SOLANACEÆ.

Solanum Dulcamara L. "Cultivated, but said to be native." Fifteen feet long, climbing. It has long bunches of violet-colored flowers and chocolate-colored berries. No. 74.

- Solanum Hindsianum** Benth. Bot. Sulph. p. 30. This species was collected by Xantus (No. 84), and referred by Dr. Gray in Proc. Amer. Acad. vol. V, and also in Syn. Flora to *S. elaeagnifolium*, but in a recent note he says "perhaps distinct." In habit the two are very similar, but in our species the flowers are much larger ($1\frac{1}{4}$ inches in diameter) as well as the fruit, and on shorter, thicker, and mostly erect pedicels. Dr. Palmer says of it: "A common upright growing plant with few stems and showy light purple flowers." Found on mesas. The following have been referred to this species: *Pringle* (1884), Sonora; *Palmer*, Guaymas; *Orcutt* (1886) San Quentin. **No. 25.**
- Physalis crassifolia** Benth. Flowers 6 to 8 lines broad. Yellow, with a dark eye. Anthers yellow, called "tomate capotillo." The fruit is edible. Mr. Brandegee thinks *P. glabra* should be referred to this species. Our plant is not the same as *P. glabra* of Xantus's collection from Cape St. Lucas. Only a few plants collected, growing under shade of bushes. **No. 76.**
- Lycium umbellatum** Rose, n. sp. Large, compact, shrubby plant, 8 to 12 feet high, with somewhat viscid pubescence: leaves fleshy, oblong to ovate-oblong, 1 to $1\frac{1}{2}$ inches long: flowers solitary in the axils of the leaves or in umbellate cluster at the end of the branches; pedicels 4 lines long: calyx $2\frac{1}{2}$ lines long, with acute lobes: corolla purple, 7 lines long, five-lobed: stamens included, glandular-pubescent at base.—Very common in alkali land or in sand near the beach. A species near *L. Fremonti* of Arizona. **No. 13.**
- Lycium Andersonii** Gray? A loose-growing plant, with many stems, 6 to 8 feet high: flowers white, berries red, edible: leaves narrowly spatulate, sometimes over an inch long; pedicels of variable length: corolla 4 lines long, the stamens exserted: fruit smaller than in *L. Andersonii*.—Grows in alkaline soil near the ocean. **No. 101.**
- Nicotiana trigonophylla** Dunal. This is called "tobacco cayotte," and was formerly used by the Indians. Common in the sandy arroyos. Formerly referred to *N. ipomopsisiflora* (Xantus, No. 88), but in Syn. Flora placed under this species. Mr. Brandegee, however, keeps it distinct. **No. 75.**

SCROPHULARIACEÆ.

- Antirrhinum cyathiferum** Benth. This plant has been collected at Magdalena Bay, *Hinds*, *Brandegee*; *Guaymas*, *Palmer* and *Echrenberg*; and in Arizona, *Palmer*. From the latter collection was made Gray's *A. chytospermum* (Proc. Amer. Acad. vol. XII.), since very properly referred to the above species by Mr. Watson. The calyx teeth and length of corolla tubes upon which Gray's species was founded are variable characters. A good figure of this species appears in the Botany of the Sulphur (t. 19), but the calyx teeth are somewhat exaggerated. Grows in sandy spots not far from the ocean. "Purple flowers, fleshy stems." **No. 91.**
- Conobea intermedia** Gray. Plant very rare about La Paz on rocky ledges. Corolla purple. This is the only specimen we have seen from Lower California. **No. 81.**

BIGNONIACEÆ.

- Tecoma stans** Juss. A small tree 10 to 15 feet high and 6 to 8 inches in diameter. The wood used by the ancient Indians for their bows and arrows, and hence the name "Palo de arco." The large yellow flowers are very fragrant. Common along arroyos. **No. 70.**

ACANTHACEÆ.

- Elytraria tridentata** Vahl. Called "Cordoncello." Used as a hot tea for pains in the stomach. Grows on rocky ridges. **No. 6.**

Calophanes peninsularis Rose, n. sp. A compact shrubby plant 4 feet high, but young parts and inflorescence glutinous: leaves small (about 1 inch long), ovate to ovate-lanceolate on short petioles: flowers axillary or on short lateral branches: bracts small, deciduous: calyx 3 lines long, deeply cleft into five narrow acute divisions: corolla purple, 15 lines long, regular, with five short obtuse lobes, a broad open throat abruptly contracted into a distinct, slender tube 5 lines long: stamens didymous; anthers mucronulate: capsule, including the thick solid stipe, 9 lines long, covered with short stipitate glands, 4-seeded (two to each cell), these flat and thin.—Common on the mesas about La Paz. **No. 20.**

Carlowrightia cordifolia Gray. Proc. Amer. Acad. XXIV. 406. A rare plant, growing under shade of bushes on mesas. This plant differs from the poor specimens of the type in the National Herbarium, which has the flowers arranged unilaterally along the spike, and the leaves more strongly veined. The corolla also is described as being white, while Dr. Palmer writes that these are canary color. Mr. Brandegee also referred here a plant from farther north. Dr. Palmer got the type from Batopilas, Mexico. **No. 107.**

Beloperone Californica Benth. Only two plants seen. No. 98 from the edge of an arroyo. Only a few slender branches in bloom at the top of the plant, which is 5 feet high. No. 99, near the bank of a dry creek, was also in poor condition, but contained a few capsules as well as flowers. The seeds are smooth (as Mr. Brandegee has pointed out) and not "coarsely rugose," as stated in Syn. Flora. Our seeds are somewhat wrinkled. **Nos. 98 and 99.**

Justicia insolita Brandegee. Proc. Cal. Acad. 2nd ser. II. 195. Grows under shade of trees and bushes. A very handsome plant. **No. 40.**

Justicia Palmeri Rose, n. sp. About 3 feet high, cinereous, puberulent: leaves lanceolate, 2 inches long, on short petioles, glabrous, or with a little appressed pubescence: flowers few, on small axillary branches or forming terminal panicles: bracts 3, foliaceous, spatulate, 3 to 5 lines long, the central one longer and broader: calyx small, $1\frac{1}{4}$ lines long, deeply 5-cleft: corolla scarlet, about 1 inch long, deeply bilabiate, its tube 6 to 7 lines long; lower lip 3-cleft, its oblong lobes 3 to 4 lines long; upper lobe with a slight notch: stamens 2, inserted in the throat; anther cells 2, parallel, unequally inserted, the lower one mucronate: capsule glabrous, 7 lines long, the stout stipe a little more than half its length; seeds 4, 2 lines long, flattened, cordate orbicular rugose.—The seeds of this species are very similar to those of *Siphonoglossa Pilosella* Torr., but in other respects it is quite different. Found growing in shade on an arroyo. Very rare. **No. 97.**

Dicliptera resupinata Juss. Only a few specimens found. This is No. 69 of Xantus. **No. 119.**

VERBENACEÆ.

Lippia Palmeri Watson (Proc. Amer. Acad. XXIV. 67), var. *spicata* Rose, n. var. The flowers are arranged in spikes sometimes over an inch long and the whole inflorescence is more compact. It is called "Origaro" and is used in cooking much as thyme and sage is in the United States, and especially with fish and sausage, and sometimes in place of tea. **No. 62.**

Lippia sp. Probably new. **No. 104.**

LABIATÆ

Hyptis laniflora Benth. Bot. Sulphur, p. 42. First collected by Mr. Hinds, and afterwards by Xantus (No. 71) at Cape St. Lucas, and not since collected until the present season. A good plate (t. 20) is found in the Bot. Sulphur. It is 6 to 8 feet high, with few upright stems and many lateral branches. It has a sage-like aroma and a decoction made from it is used in fevers. The people call it "Salvia." Very common. **No. 87.**

Hyptis tephrodes Gray. Proc. Amer. Acad. V. 164. A shrub 5 to 8 feet high, but described as "herbaceous." With much the habit of the preceding species. Found in sandy ravines. Before only known from Xantus's collection (No. 72).
No. 47.

Salvia privoides Benth. Bot. Sulphur, p. 150. A Central American and Mexican plant extending into the United States; not before found in Lower California. Only a few poor specimens seen under shade of bushes on the edge of a ravine. The style branches are as described by Bentham. **No. 10.**

AMARANTACEÆ.

Celosia floribunda Gray. Proc. Amer. Acad. vol. V. 168. Eight feet high, with a few weak stems; lower leaves very different from upper, from 5 to 7 inches long. This species was described by Dr. Gray from Xantus's specimen (No. 98), and has not been collected until recently by Mr. Brandegee at Comonda. Common plant on borders of ravines and on mesas. Bentham & Hooker, vol. III. 25, wrongly credit this species to Moquin. **No. 6.**

PHYTOLACCACEÆ.

Stegnosperma halimifolia Benth. Bot. Sulphur, p. 17. A large bushy shrub, 10 feet high. It is commonly called Amole, as the powdered root is used as soap. The plant has the reputation of curing hydrophobia. **No. 49.**

LORANTHACEÆ.

Phoradendron, sp. Material insufficient for determination. Only a few leafless branches with terminal black berries collected. **No. 138.**

EUPHORBIACEÆ.¹

Simmondsia Californica Nutt. Dr. Palmer says "this common shrub is in full bloom (January 30) at Guaymas; in 1887 it was in bloom in October." **No. 93.**

Phyllanthus (Menarda) ciliato-glandulosus Millsp. Proc. Cal. Sci. 2nd series, II. 219; named from a specimen collected by Mr. T. S. Brandegee on Magdalena Island, off the coast. Very typical specimens from ravines in the shade of bushes, La Paz. **No. 37.**

Argythamnia sericophylla Gray. A compact plant growing on low sandy bottoms. **No. 44.**

Argythamnia lanceolata Müll. Arg. (l. c.) Named from a specimen collected at Magdalena Bay. *Sorophytum lanceolatum* Benth. Typical plants from La Paz. **No. 21.**

Euphorbia (Anisophyllum) setiloba Engelm., var. *dentata* Engelm. in litt. Named from a specimen collected in San Lucas, on the peninsula, by Xantus. Two specimens of this variety are in the collection, a very compact form (No. O), reminding one immediately of the species, and a much wider spreading individual with quite large dentate leaves. Mesas, under trees. **No. 34.**

Euphorbia polycarpa Benth. Bot. Sulph. p. 50; the form *E. micromera* Boiss. DC., Prodr., XV, pt. II, 44. Common on sandy beaches near the ocean. **No. 118.**

Euphorbia tomentulosa Watson. Proc. Amer. Acad. XXII. 476. Named from a specimen collected at Rosario, in the northern part of the peninsula, by Mr. C. R. Orcutt. Small compact plants 46-61^{cm} high, found growing upon a stony ridge near La Paz. **No. 41.**

Euphorbia involuta Millsp. Proc. Cal. Acad. 2nd series, II. 227. On the specimens of this gathering the larger leaves at the bifurcation of the branches (all lost from the type specimens collected by Mr. T. S. Brandegee at Comonda) are present. We therefore add to the description of the type, larger leaves, oblong, 1^{cm} long, 5^{mm} wide; petiolate, entire, obtuse, deeply marked in the center with a large red blotch similar to that upon the leaves of *E. maculata*. A.

¹ The species of this family were determined by Dr. C. F. Millsbaugh.

- Euphorbia blepharostipula** Millsp., n. sp. Fruticose; branches covered by a thin pinkish-white, irregularly shallow-fissured bark; internodes comparatively short: leaves short petiolate, ovate-elliptical, obtuse, emarginate or slightly apiculate-mucronate, pallid beneath; stipules blephariform dentate and ciliate on the free margin: involucre pedicellate in the axils of the leaves, campanulate, glabrous without and within; lobes somewhat triangular, ciliate glands transversely ovate, brownish-green, concave; appendages white, orbicular entire: ovary glabrous: carpels very strongly keeled: styles bifid to near the base, thrice the length of the immature ovary and recurved to its base.—A loosely growing shrubby plant. Branches 12–30^{cm} long (as collected); internodes $\frac{1}{4}$ –3^{cm}, leaves 5–12^{mm} long, 2–5^{mm} wide. Common on stony ridges, near La Paz. Near *E. collectioides*. **No. 43.**
- Euphorbia Xanti** Engelm. Named from a specimen collected by Xantus at Cape San Lucas. A form with variegated (white and rose) appendages and lanceolate leaves 2–3^{cm} long and 3–7^{mm} wide. Plants 2–3 $\frac{1}{2}$ ^m high, with a number of stems and but few branches, and having flowers white within and rose colored without. **No. 12.**
- Euphorbia Comondwana** Millsp. Proc. Cal. Acad. 2nd series, II. 229. Named from a specimen collected at Comondu, on this peninsula, by Mr. T. S. Brandegee. A rather compact plant 1–1 $\frac{1}{2}$ ^m high, found growing among underbrush upon mesas. Again we regret the absence of fruit upon the specimens collected, rendering the exact place of this species uncertain. **No. 63.**
- Euphorbia dentata** Michx., var. *lasiocarpa* Boiss. DC. Prodr. XV². 72. Named from a specimen in the Herb. Petrop. collected in Tanquesillos by Karwinsky. In shade of trees. **No. 116.**
- Euphorbia eriantha** Benth. Bot. Sulph. 51. Named from a specimen collected at Magdalena Bay, on the peninsula. A very slender, long-branched form, found growing among the underbrush of mesas. **No. 46.**
- Euphorbia** sp. **No. 33.**
- Jatropha canescens** Müll., fide S. Watson. **No. 106.**

SALICACEÆ.

Mr. M. S. Bebb kindly furnishes us the following notes on the only Willow collected:

- Salix bonplandiana** H. B. K., var. *pallida* Anders. Monog. Sal. 18, DC. Prodr. 16², 200. *Salix nigra* Marsh., *forma serotina* (?) This appears to bear the same relation to more northerly forms of *S. nigra* which the serotinous state of *S. lasiolepis*, at one time recognized as a good species, does to the normal development of typical *lasiolepis*. The appearance of the aments in the axils of the mature leaves is the result of climatic influences, and would seem to be in the former instance, as it is well-known to be in the latter, of no significance, not even as indicating a variety. The leaves are not thinly puberulous, as they are said to be in the type specimens from Mazatlan, but this character is so inconsistent in forms of this group that its absence only calls for mention because of the undue prominence given it in describing *S. pallida* Kunth.

PALMÆ.

- Washingtonia Sonoræ** Watson. **No. 144.**

GRAMINEÆ.

- Heteropogon contortus** R. & S. One specimen found growing upon a rocky ledge. **No. 122.**
- Panicum barbinode** Trin. Cane-like grass, 3 to 4 feet high; the old stems lie upon the ground and root at the joints. Found in a garden. Cattle eat it readily. **No. 131.**

- Panicum Crus-galli** L., a form. Found only a few plants by a ditch of water in a garden. No. 130.
- Setaria caudata** Beauv. Cane-like grass, 4 to 5 feet high. Found in low places near dry creeks. No. 125.
- Cenchrus Palmeri** Vasey. Proc. Cal. Acad., 2nd series, II. 211. Common on low, sandy bottoms. No. 132.
- Aristida Californica** Thurb. Found among bushes on mesas. No. 128.
- Aristida dispersa** Trin. Habitat as 127. No. 127a.
- Aristida dispersa**, var. ? Found upon rocky hillsides. No. 128.
- Muhlenbergia debilis** Trin. Grew in the shade of bushes and rocks. No. 129.
- Chloris elegans** H. B. K. Found in a garden by a water ditch. No. 133.
- Bouteloua polystachya** Torr. Found among bushes on mesas. No. 226.
- Monanthochloe littoralis** Engelm. Very common in salt marshes. No. 123.
- Diplachne imbricata** Thurb. Grew by a water ditch in a garden. No. 134.
- Eragrostis Purshii** Schrad., var. Habitat as 134. No. 135.
- Rhachidospermum Mexicanum** Vasey. Bot. Gaz. XV. 106, Pl. XII. Found on sandy bottoms at a short distance from the ocean, growing sparsely in small bunches. A few plants only had seed. No. 124.

LICHENS.

The following lichens were determined by Mr. Walter Evans:

- Ramalina complanata** Ach. No. 85a.
- Physcia tribacia** Tuckerman. Found near the ocean. No. 85b.

SAN PEDRO MARTIN ISLAND PLANTS.

Dr. Palmer visited this island¹ two years ago, making a collection of nineteen species, twelve of which were considered peculiar to the island. On February 13 of the present year he spent one day on this island and obtained but three plants, all Compositæ. One is the new genus *Pelucha* of Mr. Watson, now collected in splendid condition and in abundance. Another proves to be a new species of *Hofmeisteria*, and the third a *Perityle*, new to the island. Dr. Palmer makes the following note with reference to the flora of the island: These plants did not bloom during the rainy season of 1887, as they are winter bloomers. There is no especial flora making its appearance, as has been supposed, during the winter. No rain has fallen since early in November, and all plants except those deeply rooted are dry and dead. The following is a list of the twenty species known to inhabit the island. Those which are peculiar to the island are marked thus.*

**Sphæralcea*, sp.
Abutilon aurantiacum Wats.
Petalonyx linearis Greene.
Mentzelia adhaerens Benth.
Echinopepon insularis Wats.
Cereus Pringlei Wats.
Opuntia ?
Hofmeisteria laphamioides Rose.
Baccharis sarothroides Gray.
 **Pelucha trifida* Wats.

Perityle Emoryi Torr
Trixis angustifolia DC., var *latiuscula* Gray.
Nicotiana trigonophylla Dunal.
Stegnosperma halimifolia Benth.
Euphorbia petrina Wats.
Ficus Palmeri Wats.
Cyperus aristatus Rottb.
Muhlenbergia tenuella Trin.

¹ For note concerning this island see Watson, Proc. Amer. Acad. XXIV. 37.

Hofmeisteria laphamioides¹ Rose, n. sp. Shrubby, 3 feet high, glandular pubescent: leaves opposite or alternate above, 6 or 8 lines long, on petioles somewhat longer, triangular, doubly crenate: flowers in small corymbose clusters, sometimes pedicels very short: involucre 4 lines long, of linear-acuminate bracts in about 3 series: flowers numerous: corolla white, $2\frac{1}{2}$ to 3 lines long: style deeply cleft, much exserted: pappus of 8 to 10 scabrous setæ, alternating with as many paleæ.—Very common over the summit of San Pedro Martin Island. February 13.

Dr. Palmer says: "A compact plant with dense green leaves just coming into bloom." This plant was collected by Dr. Palmer on the same island (No. 406) in 1887, but in very poor condition. It is the *Laphamia* (?) sp., Proc. Amer. Acad. XXIV. 37. **No. 148.**

Pelucha trifida Watson. Proc. Amer. Acad. XXIV. 55. This plant was described as a new genus by Dr. Watson last year. Dr. Palmer has now collected it in great abundance. The stems are covered with a white tomentum, forming a strong contrast with the abundant golden-yellow flowers. It has a very strong aroma as of cloves and cinnamon, and so powerful is this at times that it causes persons to sneeze and cough. **No. 150.**

Perityle Emoryi Torr. This is the same form collected by Dr. Palmer at Los Angeles Bay (No. 562), 1887. Only two plants found at the south end of the island. **No. 149.**

RAZA ISLAND PLANTS.

Dr. Palmer spent one day (February 12, 1890) on this island, and collected eight species of Phanerogams with one lichen. The following is from his notes:

Isla Raza is an island 136 miles northwest from Guaymas, and from 45 to 50 miles west from San Pedro Martin Island. It is three-fourths of a mile long (from east to west) and half a mile wide; it rises about 100 feet above the water; being covered with a deposit of guano, it has a whitish appearance. The island is exceedingly rocky, except a few low places which seem to have been subjected to the action of large volumes of water; these spots produce a few varieties of plants which are usually found upon alkali soil (some of the same plants were found on the rocky surfaces also). Above these places were found three patches of Cactus. One plant of *Cereus Pringlei*, 10 feet high, stood among loose rocks above high tide. There had been no rain-fall on the island for more than a year.

Opuntia tunicata Lehm. Our plant seems the same as that of Parry and Palmer's distribution; fruit 6 to 10-jointed. A few small patches seen in exposed places among rocks. **No. 160.**

Opuntia echinocarpa Engelm. & Bigel. A few small patches among rocks. Not in flower, and but few scattered fruits. **No. 161.**

Sesuvium Portulacastrum L. A very common plant in large patches near the salt water. Dr. Palmer says this plant has been often mistaken for a low grass by persons passing the island. In its exposed position and dense green color on a barren island of almost total whiteness it would naturally command notice by passing vessels. **No. 153.**

Salicornia ambigua Michx. Only two small patches of this plant seen near the beach. **No. 152.**

¹ Dr. Palmer has since collected this species at Santa Rosalia, but a more glabrous form with the lower leaves oval and with cordate base. The plant is quite bushy, 2 to $2\frac{1}{2}$ feet high, with fleshy leaves, just coming into bloom March 1.

- Atriplex dilatata** Greene. Pitt. I. 264. Grows on low places on the island without rocks. No. 155 is the fertile plant, and 156 is the sterile plant. Dr. Palmer says the sterile heads are purple before opening. **Nos. 155 and 156.**
- Atriplex insularis** Rose, n. sp. Dioecious, woody below, 5 to 6 feet high, much branched, glaucous throughout: leaves 9 to 15 lines long, oval with cuneate base and broadly spatulate, on short petioles, obtuse or retuse: inflorescence of male plant almost naked and a dense panicle of glomerules; of female plant a dense somewhat leafy spike: bracts a line long, a little broader than long, with truncate apex and with small teeth, the sides with two conspicuous toothed crests.—One of the commonest plants of the island. It grows in the low places where there are no rocks, and in the rocky ledges wherever there is soil. No. 158 is the fertile plant and 159 the sterile. Our species seems nearest *A. Palmeri* of Guadalupe Island, but is very different in its bracts, etc. **Nos. 158 and 159.**
- No. 157.** An unknown shrub without flowers or fruit, and almost destitute of leaves. Only a few plants seen. It resembles *Pluchea borealis*.
- No. 154.** Also, in poor condition, a perennial with many small pubescent leaves.

SANTA ROSALIA AND SANTA AGUEDA PLANTS.

From San Pedro and Raza Island Dr. Palmer visited two places on the eastern side of the peninsula of Lower California, namely, Santa Rosalia and Santa Agueda. At the first-named place he spent ten days (February 20 to March 3), and after visiting Santa Agueda returned for another day (March 15). This locality is 92 miles nearly northwest from Guaymas. The country is hilly and rough, covered with rocks. Only two heavy rains have fallen this season; the strong northwest winds which prevail here soon destroyed any indication of rain. Only the most favorable circumstances admit of plants blooming at this season.

March 4–5 was spent at Santa Agueda, 10 miles from Santa Rosalia. Dr. Palmer says this locality is watered by springs and surrounded by low stony mountains, with a thin, diversified vegetation that now looks parched; even the cactus is without flowers. The small patches of land that can be cultivated afford but few plants, and the great number of domestic animals kept here (owing to the springs) devour everything outside of the inclosures except what is so absolutely bitter or thorny that they can not do so. All the vegetable used by the miners at Santa Rosalia are brought from this place.

CRUCIFERÆ.

- Draba Sonoræ** Greene. Bull. Cal. Acad. II. 59. In an abandoned garden. To this species Palmer's 611, from San Quentin, should have been referred. Santa Agueda, February 24 to March 3. **No. 237.**
- Cardamine Palmeri** Watson. The petals are 3-lobed. Found in shade at the edge of a garden, Santa Agueda, March 4 to 6. **No. 244.**
- Sisymbrium canescens** Nutt. Very common. Found in an abandoned garden at Santa Agueda, February 24 to March 3. **Nos. 238 and 243.**
- Lepidium intermedium** Gray. Very common in an abandoned garden, Santa Agueda, February 24 to March 3. Not before collected in Lower California. **No. 234.**

POLYGALACEÆ.

Krameria canescens Gray, var. *paucifolia* Rose. Dr. Palmer says it is a shrub with many branches, which interlace, forming a dense mass. The older wood is of a copper color, and the flowers of a plum color. The wood is said to yield a yellow dye. It imparts a cherry-red to water. It is commonly called "Mezquitilla." Santa Agueda, March 4-6. No. 252.

TAMARISCINEÆ.

Fouquieria spinosa H. B. K. A thorny bush 5 to 16 feet high, according to soil, with the trunk 1 to 2 feet long and 6 inches in diameter. The flowers are bright scarlet, clustered at the ends of the branches. In the old plant the bark breaks away and gives off a gummy substance. The wood is hard and makes a very good fire, and when burning gives off a pleasant odor. Santa Rosalia, March 15. No. 266.

MALVACEÆ.

Sphæralcea albiflora Rose, n. sp. Two to 2½ feet high; slender, densely covered with white stellate pubescence: leaves oval to ovate, 9 to 18 lines long, the petiole somewhat shorter, somewhat rugose, subcordate base, crenate margin: flowers white, 6 lines broad, in short axillary clustered racemes: calyx 3 lines long, with slender acutish lobes: carpel reniform, a full line long, the lower part strongly and finely reticulated, the upper and sterile part very small.—In a cañon growing in shade, near Santa Rosalia, March 3.

This plant mostly resembles *S. sulphurea* of Guadalupe Island in habit and carpellary structure, but the pubescence lacks the tomentum, the calyx lobes not so broad; the carpels, while similar, are easily separated; the carpel is slender and shorter, with stronger and finer reticulations and a shorter sterile part. In habit resembling *S. axillaris*, but with very different carpels. No. 205.

Sphæralcea violacea Rose, n. sp. Simple stems about 3 feet high, densely covered with a stellate pubescence: leaves ovate to lanceolate acuminate, 2 to 2½ inches long: calyx, 2½ lines long, its lobes ovate, acute: petals, 5 lines long, lilac: carpels 1 to 1½ lines long; the sterile part about half the length of the carpel, obtuse.—Growing in shade at Santa Rosalia, March 15, and seemingly not common.

Resembling in habit some specimens of *S. Fendleri* in the Gray Herbarium but with very different carpels. The carpels most resemble those of Xantus's plant (No. 10) from La Paz, but the sterile part of the carpel not so large. No. 206.

Horsfordia Newberryi Gray. Four to 6 feet high: lower leaves (including petiole) 5 to 7 inches long: flowers golden-yellow. Gravelly arroyos and sandy hillsides. Santa Rosalia, February 14 to March 3. No. 169.

Abutilon Dugesii Watson? Proc. Am. Acad. XXI. 447. Santa Rosalia, March 15. No. 199.

STERCULIACEÆ.

Ayenia microphylla Gray. Santa Rosalia, February 24 to March 3. No. 268.

MALPIGHIACEÆ.

Hiræa macroptera DC. "Gallinita." The roots of this plant are considered of medicinal value. Santa Agueda, March 4 to 6. No. 251.

ZYGOPHYLLACEÆ.

Fagonia Californica Benth. Stems terete; the upper part of the stem closely set with subsessile glands. Only a few plants seen and mostly out of bloom and dry. On stony ridges. Santa Rosalia, February 24 to March 3. No. 180.

The same. In sandy spots in stony ravines. "Bloom, crimson-colored." Santa Rosalia, February 24 to March 3. No. 196.

Fagonia Palmeri n. sp. Stout perennial, woody at base, 1 to 1½ feet high, more or less glandular pubescent: leaves opposite, digitate; leaflets 5 to 7, linear, with spiny tips, 4 to 5 lines long; stipules long erect spines: petals 4 lines long, deep rose color.—Santa Rosalia, February 24 to March 3.

This species very much resembles *F. Californica* in fruit and flowers, but of very different habit, leaves, and upright stipules; and in its 5 leaflets differs from all the other described species of this genus. Dr. Palmer says of it: grows in a bunch from several stems 1 to 1½ feet high, the lower ones often lie on the ground. It is very spiny. The leaves, especially upon the lower two-thirds of the plant, have a decided golden hue, which is very noticeable at a distance. **No. 209.**

RHAMNACEÆ.

Colubrina glabra Watson. Proc. Amer. Acad. XXIV. 44. The plant is much larger than the one from Guaymas. It is here a small tree or bush 5 to 12 feet high, scrubby in character. The branches are often slender and pendant. Dr. Palmer thinks this is owing to the soil and moisture, for in dry and stony places they are short and straight. Only a single plant found in flower, and they of a yellowish-green color. It is very common in stony gulches. Santa Rosalia, March 15. **No. 267.**

SAPINDACEÆ.

Paullinia (?) sp. Climbing or trailing over bushes: leaves 3-foliolate: flowers in small clusters: petals 4: stamens 8. Agueda, March 4 to 6. Most of the leaves had fallen; the remaining ones closely resemble *B. Sonora*. The fruit (immature) is different and is apparently tuberculate. Only 3 plants seen in a sandy gulch at Santa Agueda, March 4 to 6. **No. 263.**

LEGUMINOSÆ.

Hosackia strigosa Nutt. The same form as collected by Palmer at Los Angeles Bay (602), in 1887. Only three plants found, in a cañon near Santa Rosalia, March 1. **No. 201.**

Dalea Parryi Gray. Santa Rosalia, February 23. **No. 181.**

Dalea mollis Benth. Not common. Santa Rosalia, February 23. **No. 200.**

Dalea Emoryi ? Gray. This seems to be the same glabrous form that Mr. Brandegee got at Santa Maria. Common in low, sandy places, growing about 3 feet high. It yields a yellow dye. Santa Rosalia, February 24 to March 13. **No. 179.**

Dalea megacarpa Watson. Proc. Amer. Acad. XXI. 359. A large bushy plant 2½ feet high; flowers yellow, with an agreeable honey-like odor. Common in arroyos. Santa Rosalia, February 24 to March 5. **No. 182.**

Tephrosia Purisimæ Brandegee. Proc. Cal. Acad. 2nd ser. II. 149. Hardly distinguishable from *T. Palmeri* except in the purple flowers. It was about past flowering March 1, when Dr. Palmer visited this region. It grows sparsely in a cañon near Santa Rosalia. **No. 198.**

Parkinsonia microphylla Torr. Called "Lebon" (?) Dr. Palmer says the young branches are much relished by domestic animals and are largely gathered by the natives for this purpose. **No. 265.**

Cassia Covesii Gray. Branching at base, 3 to 5 feet high; a free bloomer. The pods about 8 in a compact cluster. The stipules are longer than described, being 5 to 6 lines long. The pubescence is of a yellowish hue. Dr. Palmer says it differs from the Guaymas form and in appearance is somewhat different from our herbarium specimens. Palmer's Los Angeles plant (557 of 1887) is the same as this one. Santa Rosalia, March 5. **No. 192.**

Pithecolobium, sp. A large tree growing near water, with a trunk 5 feet long and 8 inches in diameter, with an immense top out of all proportion to the trunk, and a great profusion of yellow, rather sweet-scented, flowers. A useful wood. The flowers in capitate clusters on peduncles 1 to 2 inches long. The numerous short stamens are united into a very short tube; the ovary on a stipe of twice its length. The generic position of this species is doubtful, but its connate stamens forming a tube places it in Bentham's section *Ingeæ*. Santa Agueda, March 4 to 6. **No. 261.**

ONAGRACEÆ.

Oenothera cardiophylla Torr. One and one-half feet high; growing in shade. "Bloom yellow;" drying reddish. Santa Rosalia, February 24 to March 3. **No. 204.**

LOASACEÆ.

Mentzelia adhærens Benth. Only one plant seen and this in a garden. Santa Agueda, March 4 to 6. **No. 254.**

Petalonyx linearis Greene. A bushy plant 3 feet high. Common in the arroyos near the sea. Santa Rosalia, February 24 to March 3. **No. 189.**

RUBIACEÆ.

Houstonia brevipes Rose n. sp. About 1 foot high, branching, smooth: leaves filiform, 9 to 12 lines long; stipules small, with 1 or 2 setæ: pedicels 2 to 3 lines long or wanting: calyx in flower 1 line long; in fruit 2 lines long, with 4 acute divisions: corolla pink, with slender tube 3 lines long, and lobes 2 lines long: capsules globular, about one-third free from the calyx, about 40 seeded.—Only a single specimen collected near Santa Rosalia, in a cañon, February 24 to March 3.

This species seems nearest *H. longipes*, but with more numerous seed, etc. **No. 202.**

COMPOSITÆ.

Hofmeisteria laphamioides Rose. Grows in shade of rocks (see page 79) Santa Rosalia, March 1. **No. 208.**

Hofmeisteria pubescens Watson. Proc. Amer. Acad. XXIV. 54. Akenes often with 3 setæ. "A compact roundish plant growing in crevices of rocks and shady recesses of hills, mountains, and along shady sides of arroyos. When exposed the leaves are larger and more fleshy. The wood is brittle: bloom light pink, rather sweet scented; free bloomer. The very dry surroundings cause this plant to be very noticeable." Santa Rosalia, February 24 to March 3. **No. 178.**

Brickellia brachiata Gray. Proc. Amer. Acad. XXI. 385. This differs from the type in being glabrous. The plant is eaten readily by domestic animals, and it was hard to find good botanical specimens, although the plant is very common. Santa Rosalia, March 15. **No. 269.**

Pluchea camphorata DC. Commonly called "Canela," the Spanish of cinnamon, which the smell of the flowers is considered to resemble. When growing among bushes and on the outskirts of gardens where there is plenty of moisture it is 8 to 10 feet high. Just coming into bloom, Santa Agueda, March 4 to 6. **No. 253.**

Gnaphalium Sprengelii Hook. & Arn. In an old garden, Santa Agueda, March 4 to 6. **No. 235.**

Hymenoclea Salsola T. & G. A loose-growing bushy plant, 4 feet high. In cañon near Santa Rosalia, February 24 to March 4. **No. 197.**

Franseria ambrosioides Cav. Commonly called "Chicoria." The plant when cooked in oil is much used and esteemed for local application in rheumatism. Common in waste places along wet ditches. Santa Agueda, March 4 to 6. **No. 229.**

- Heliopsis bupthalmoides** Dunal. Only a single specimen found in a moist spot at the edge of a garden, Santa Agueda, March 4 to 6. No. 230.
- Eclipta alba** Hasskarl. Santa Agueda, March 4 to 6. No. 228.
- Viguiera deltoidea** Gray, var. **Parishii** Rose. About two feet high. Collected at the edge of garden among rocks, Santa Agueda, March 4 to 6. No. 250.
- Leptosyne parthenioides** Gray, var. **dissecta** Watson. Only a few plants seen along the edge of ditches in a garden, Santa Agueda, March 4 to 6. No. 248.
- Perityle Emoryi** Torr. Santa Rosalia, March 4 to 6. No. 184.
- Perityle deltoidea** Watson. Collected growing with *P. Emoryi*. No. 185.
- Perityle aurea** Rose n. sp. About 10 inches high, much branched and spreading, somewhat pubescent and glandular: lower leaves broader than long, an inch broad, irregularly lobed and serrate; upper leaves becoming very small: rays yellow: disk corolla with slender tube abruptly passing into the swollen tubular campanulate throat: style broader, slender, with slender acuminate appendages: akenes small (a line long), linear and straight, with ciliate margins: the pappus of a crown of united squamellæ with fimbriate edge and a short awn.—Santa Rosalia, February 24 to March 3.
- It resembles *P. Emoryi* most in habit and akenes, but its yellow rays, more swollen corolla throat, slenderer, less granular corolla tube and style tips keep it out of this species. It grows with *P. deltoidea*, but of different habit, leaves, style tips, etc. No. 185^a.
- Perityle Fitchii** Torr. Only a single plant seen; this under an overhanging rock at the outer edge of a garden. This plant is evidently taller than the species has been described, as branches which Dr. Palmer has collected are 15 or more inches long; many of the leaves opposite. Santa Agueda, March 4 to 6. No. 247.
- Porophyllum crassifolium** Watson. Proc. Amer. Acad. XXIV. 57. The plant is deep-green, which attracts attention; as the few associated plants are now dry and dead. The leaves are very fleshy and the plant has a strong aroma of the cultivated *Rue*. Grows in cañons near the sea. Santa Rosalia, February 24 to March 3. No. 177.
- Bebbia juncea** Greene. The leaves are not entire, but strongly toothed or lobed. The involucre bracts are very short and ovate. Santa Agueda, March 4 to 6. No. 249.
- Encelia farinosa** Gray. Very common plant everywhere, but only in sheltered places, and where there was plenty of moisture, was the plant found in bloom. Rays bright yellow; free bloomer. No animal eats it. Santa Rosalia, February 24 to March 3. No. 186.
- Peucephyllum Schottii** Gray. The pappus in our plant is different from Gray's description; it is of two kinds; the outer and shorter is composed of numerous capillary bristles, the inner of long linear paleæ with strong mid rib. Santa Rosalia, March 1. No. 207.

PLUMBAGINACEÆ.

- Plumbago scandens** L. Only a single plant in an old garden, Santa Agueda, March 4 to 6. No. 233.

PRIMULACEÆ.

- Samolus ebracteatus** H. B. K. Santa Agueda, March 4 to 6. No. 256.

APOCYNACEÆ.

- Vallesia dichotoma** Ruiz & Pavon. Called "Welatave." Common; sea beaches, and near alkali spots. Santa Agueda, March 4 to 6. No. 260.

ASCLEPIDACEÆ.

- Philibertia linearis* Gray, var. *heterophylla* Gray. Only one small plant found in a garden at Santa Agueda, March 4 to 6. No. 231.
- Asclepias albicans* Watson. Proc. Amer Acad. XXIV. 59. Santa Rosalia, February 24 to March 3. Also collected by Oerunt, 1889, from the Colorado Desert, California. No. 193.

HYDROPHYLLACEÆ.

- Phacelia scariosa* Brandegee. Santa Agueda, March 4 to 6. No. 236.
- Nama demissum* Gray. In an old garden, Santa Agueda, March 4 to 6. No. 240.
- Ellisia chrysanthemifolia* Benth. Probably from an old garden at Santa Agueda. No. 239.

BORRAGINACEÆ.

- Coldenia canescens* DC. Flowers rose-colored. On stony mesas and arroyos. Santa Rosalia, February 24 to March 3. No. 195.
- Tournefortia capitata* Mart. & Gal. A shrub 4 feet high, with many branches and a profusion of white flowers which are as sweet scented as the cultivated heliotrope. "Berries of a waxy-white color, and pulpy." Only 4 plants seen in a garden, Santa Agueda, March 4 to 6. No. 246.
- Krynitzkia*, sp. In an old garden, Santa Agueda, March 4 to 6. No. 241.
- Krynitzkia*, sp. With the last. No. 242.
- Krynitzkia racemosa* Greene. Santa Rosalia, February 24 to March 3. No. 188.
- Krynitzkia peninsularis* Rose, n. sp. Several feet high, compact, and bushy; older stem of grayish color, with a coarse, more or less compressed pubescence: leaves numerous, especially on the short lateral branches, linear, 9 lines or less long, pubescence papillose at base: spike more or less elongated, leafy bracteate: pedicels short, erect: calyx 3 lines long, deeply cleft into linear divisions: corolla white, 4 lines broad: nutlets 4, about a line long, with a large oval or triangular scar on the ventral side, below the middle; the ventral angle sharp.—A common plant in a peculiar cañon in a gypsum mountain near Santa Rosalia, February 23 to March 3.
- This is a peculiar species belonging to Gray's section *Amblynotus*. No. 203.

SOLANACEÆ.

- Lycium*, sp. Flowers 4-merous. A bush 5 to 6 feet high; flowers purple. In stony ravine, Santa Rosalia, February 24 to March 3. No. 183.

SCROPHULARIACEÆ.

- Mimulus luteus* L. In a waste field, Santa Agueda, March 3 to 5. No. 233.

ACANTHACEÆ.

- Calophanes Californica* Rose, n. sp. A very branching shrub, 3 to 4 feet high; older stems white; younger stems and leaves glutinous pubescent: leaves lanceolate, about an inch long entire: calyx deeply cleft into long slender lobes 6 to 8 lines long: corolla purple, 2 inches long with a broad open throat, abruptly contracted into a slender tube 1 inch long: stamens mucronate at base: posterior lobe of style short but evident, the anterior long filiform: capsule 9 to 10 lines long, including the style: seeds 4, flat and thin.—Collected at Santa Rosalia, February 24 to March 3.

The stickiness and odor is much like that of green tobacco. It has very large, handsome flowers. It resembles very much some species of *Ruellia*, but has the mucronulate anthers and 4-seeded capsule of *Calophanes*. No. 190.

Beloperone Californica Benth. About 3 feet high, growing in stony gulches. Grazing animals will not eat it. Santa Agueda, March 4 to 6. **No. 255.**

Berginia Palmeri Rose, n. sp. A foot and a half high, very shrubby: largest leaves broadly ovate to oblong, an inch long, 6 to 9 lines broad: spikes rather dense, 1 to 2 inches long, glandular: corolla pink: seeds flattened (not rugose) puberulent.

A careful comparison of the type specimens as found in the Gray Herbarium of *Pringleophytum lanceolatum* and *B. virgata* convinces us that they are the same species. Mr. Brandegee, in his paper on the plants from Baja California, suggested that the two were probably the same. **No. 272.**

VERBENACEÆ.

Lippia fastigiata Brandegee. Proc. Cal. Acad. 2nd series, II. 196. "Damiana." It has a wide medicinal reputation. It is much used by the common people in place of China tea. The flowers are pinkish and purple. Santa Agueda, March 4 to 6. **No. 264.**

NYCTAGINACEÆ.

Boerhaavia viscosa Lag. Only a few plants seen at the edge of a garden, Santa Agueda, March 4 to 6. **No. 225.**

Boerhaavia scandens L. Only two plants seen in a stony ravine. Flowers a creamy white. Santa Agueda, March 4 to 6. **No. 262.**

CHENOPODIACEÆ.

Atriplex Barclayana Dietr., form. But a single plant found, in alkali ground, Santa Agueda, March 4 to 6. **No. 259.**

POLYGONACEÆ.

Pterostegia drymarioides F. & M. Santa Rosalia, March 15. **No. 271.**

EUPHORBIACEÆ.

Euphorbia, sp. Very common. Santa Rosalia, March 3. **No. 187.**

Euphorbia, sp. Common in the outer edge of a garden, Santa Agueda, March 4 to 6. **No. 245.**

URTICACEÆ.

Ficus Palmeri Watson. Proc. Amer. Acad. XXIV. 77. The leaves somewhat larger than originally described; sometimes 4 inches long by 3 broad: found growing in a crevice in the pure gypsum, without any apparent soil: the trunk only about 6 inches in diameter. Santa Rosalia, February 27 to March 3. **No. 210.**

NAIADACEÆ.

Potamogeton pectinatus L. A very common plant at Santa Agueda. **No. 226.**

TYPHACEÆ.

Typha angustifolia L. Called Tule. Much used in covering houses and for which it is largely gathered and sold by the common people. The stems are often 15 feet high. Santa Agueda, March 4 to 6. **No. 212.**

PHYTOLACCACEÆ.

Stegnosperma halimifolia Benth. A large, loose-growing shrub, 5 to 10 feet high. Common near the sea beach. Santa Agueda, March 4 to 6. **No. 258.**

GRAMINEÆ.

- Paspalum distichum** L. This plant grows upon alkali soil along water ditches, and even in the water; much alkali causes the runners to become reddish. It grows freely where sugar cane is raised, if not destroyed by cultivation; most of the specimens were from an unfavorable situation. Commonly called "Gramma." It is considered of value as a medicinal plant, being used for kidney troubles and gonorrhœa. **No. 214.**
- Panicum sanguinale** L. Found upon the top of the embankment to a water ditch; only a few plants seen. **No. 222.**
- Panicum colonum** L. Found in a field where sugar cane had been raised at some past time, and which was being replanted. **No. 223.**
- Cenchrus echinatus** L. "Pests of every garden; no animal will eat it after it blooms." **No. 220.**
- Aristida bromoides** H. B. K. *form.* **No. 270.**
- Muhlenbergia debilis** Trin. Rather abundant in the shade of plants; in a moist place in a garden. **No. 217.**
- Sporobolus argutus** Kunth. Habitat same as 223. **No. 224.**
- Agrostis verticillata** Trin. Grows on banks of ditches, hanging over to the water. Only one specimen found in a garden. **No. 221.**
- Diplachne imbricata** Thurb. Found in a garden. Only these specimens seen. **No. 216.**
- Phragmites communis** Trin. "Near the water the cane grows from 20 to 25 feet high, the lower part being very slender for the height, as the specimens show. Domestic animals devour it. It is used for various purposes by the natives. They cut it to certain lengths, and having split it, beat it flat and then weave it in and out, making a large square mat, with which they form sides or ends of the houses; they place it over the rafters before the tule thatch is put on; they use it to cover verandas, and also for screens for doors." **No. 211.**
- Eragrostis major** Host. Found in garden. The only specimens seen. **No. 215.**
- Eragrostis Purshii** Schrad. Common among alfalfa; but few of the plants were in good condition. **No. 218.**
- Distichlis maritima** (?) *form.* "Grows in thick masses in wet alkali soils; saw much that was cut to feed animals, which was twice the size of these specimens, but they had no flowers or seed; these were the best to be had; found on a dry spot on the outer edge of a garden." **No. 219.**

PLANTS COLLECTED AT GUAYMAS.

The plants collected at Guaymas were obtained at several different times. No very extensive collection was made at this time, as this region was so thoroughly examined in 1887; yet in spite of this former almost exhaustive collection this region still yields some new species and others of great interest. Of this latter class is to be mentioned *Prosopis heterophylla* Benthams, now for the first time obtained in flower, and *Sphæralcea Coulteri* Gray.

Sphæralcea Coulteri Gray.¹ A little annual 2 to 6 inches high, growing scatteringly among other small plants on sandy plains near Guaymas. The flowers are small but quite showy, of "bright amber color," but in dried specimens rose-colored. The specimens are not in fruit, but Dr. Watson has kindly sent me

¹Dr. Palmer has since sent fruiting specimens of this species, leaving no doubt as to its identity.

the specimens of these species in the Gray Herb., and it is clearly the same *S. Coulteri*. It differs widely from all other *Spæralceæ* in habit as well as carpels. The locality at which Coulter collected this species is doubtful, and it is as probable he got it at Guaymas as in either California or Arizona, February 13 to 17. **No. 171.**

***Zizyphus obtusifolia* Gray.** A loose-growing, thorny shrub, generally found in mesquit thickets; fruit black. February 15 to 17. **No. 162.**

***Sapindus marginatus* Willd.** In cultivation at Guaymas. **No. 176.**

***Cæsalpinia Palmeri* Watson.** Proc. Amer. Acad. XXIV. 47. Dr. Palmer says: Abundant plant, blooming now (February 11) with as much freedom as it does in the rainy season. No. 70 of 1887 collection. **No. 146.**

***Coursetia glandulosa* Gray.** In our remarks on this species from La Paz, p. 68, we mentioned that *C. microphylla* should probably be referred to this species. A careful examination of a large supply of material from Guaymas convinces us that the two species are the same. *C. glandulosa* was collected by Xantus from the extreme point of Lower California in flower, with merely the old leaves remaining. *C. microphylla* came from Pringle's Arizonian collection, and is somewhat more advanced with the small leaves, but the older and larger ones gone. The leaflets of this species are very variable, and the two forms are sometimes to be found on the same specimens. In most of the specimens sent the leaflets are as in *C. microphylla*, small (1 to 3 lines), long sericeous pubescent, while on the same plant we find the large (7 lines long by 3 to 4 lines broad) almost glabrous leaflets of the original *C. glandulosa*: the flowers are white, becoming rose-colored. A very common shrub in gravelly arroyos about Guaymas. It is 4 to 6 feet high, with several stems from the base and somewhat spreading. A very profuse bloomer. February 15 to 17. It seems also to have been collected here by Palmer without flowers or fruit in 1887, but not reported by Mr. Watson. **No. 163.**

***Parkinsonia Torreyana* Watson.** About 15 feet high with large top: flowers yellow. Dr. Palmer says that as the flowers open the leaves fall and the plant remains without leaves until the seeds are mature. **No. 275.**

***Acacia Willardiana* Rose.¹** A slender tree, 10 to 15 feet high, with few drooping branches, glabrous, and without spines of any kind: leaves with minute, deciduous stipules; petioles phyllodia-like, 3 to 12 inches long by 1 line broad, either naked or with mostly 1, sometimes 2, and rarely 4 pairs of pinnae at the tip; leaflets where present 4 to 5 pairs, sometimes 12 to 15, somewhat fleshy, indistinctly 1 to 2 nerved, 1 to 2½ lines long, abruptly acute, glabrous or minutely pilose, as also the petioles and younger parts of the stem: the inflorescence a panicle of slender spikes terminating the slender branches: spikes 2 inches long; flowers yellow: calyx companulate, about a line long, with 5 broad obtuse teeth: petals a little longer, distinct to the base, oblong to cuneate oblong, obtuse or abruptly acute: stamens 140 to 150. "Legumen planum, rectum, 4½ pollicare, 5 lin. laterum." *Prosopis* (?) *heterophylla* Benth. Lond. Jour. Bot.

¹ While reading the proof of this paper a letter comes from Dr. Palmer, under date of September 10, 1890, inclosing two mature legumes of this species, which now for the first time have been collected, and may be described as follows:

Legume glabrous, oblong to linear oblong, 2 to 4 inches long, 5 to 7 lines broad, obtuse at tip, cuneate at base, extending into the short stipe; some constricted, others not at all, membranaceous, with delicate irregular reticulations; seeds brownish, oval to oblong, 4 to 5 lines long.

The numerous filaments are still present in these mature specimens, forming a white fringe surrounding the stipe, and it is a little strange that they had not been observed by Benthon, who had the immature legumes.

Only two mature legumes were found, all the others having been killed by the hot winds of June. Dr. Palmer says "this was confirmed by my own observation, for an entire day was spent among *Acacia Willardiana* and I only found two pods."

(1846), v. 82; Rev. Mim., 379. Watson, Index, 252; and Proc. Amer. Acad. XXIV. 48. Hemsley Biol. Centr.-Amer. I. 344.

Hab. "Sonora alta in Mexico, Coulter;" Guaymas, Palmer (No. 628), 1887, and now from the "rocky islands and ledges on the coast of Guaymas harbor."

The collection of this plant in flower for the first time enables us to decide its generic position. It was collected by Dr. Thomas Coulter fifty or more years ago, but only in fruit, and there is apparently but a single specimen in existence, which is in the herbarium of Trinity College, Dublin. It was found by Mr. Bentham when on a visit to this herbarium, and was described by him in 1846 in the Lond. Jour. Bot. as a new species of *Prosopis*. It was doubtfully referred here, however, and its possible reference to *Acacia* was mentioned. Palmer's specimen of 1887 was without flower or fruit, and Mr. Watson could do no more than identify it as Bentham's species. Although in habit the species of the two genera are similar, with the flowers the two are readily and clearly separated, *Prosopis* having always ten stamens, while in *Acacia* they are numerous, and in ours decidedly so, being 140 to 150. There are several little points of difference between Bentham's description and our plant, which should be noted here, but the general characters are so clear as to leave no doubt as to the identity of the two plants. Bentham says "stipulae obsolete," while we find small but deciduous stipules; also "pinnae 2, rarius 4," while in none of our specimens do we find more than one pair; again "foliola 12 to 15 jnga," while ours are mostly 4 to 6, a few are 10 to 15. The young branches are white, as mentioned by Bentham, but in age become a grey or reddish brown. Unfortunately a new name must be coined for the species, *A. heterophylla* having long before (1805) been used by Willdenow; neither can it be named for either of the collectors, Coulter or Palmer, as they both have species named for them in the genus; nor for Mr. Bentham, who, although not so fortunate, is represented in the synonymy of this genus. At the request of Dr. Palmer we have named this species for Mr. Alex. Willard, United States consul at Guaymas, Mexico, who has given every aid possible to him on his several visits at that place. **No. 164.**

Cereus pecten-aboriginum Engelm. in Watson, Proc. Amer. Acad. XXI. 429. The flowers of this species are collected now for the first time, and the following additional characters are supplementary to the description found in Mr. Watson's paper referred to above.

Flowers 2 to 3 inches long: ovary closely covered with dense soft hair, without spines or rarely a few: sepals purplish, succulent: petals white, fleshy: stamens very numerous: style with ten linear stigmas with spiny tips.

The plants grow 30 feet high and a foot or more in diameter, with many branches. The fruit is formed at or near the top. **No. 274.**

Hofmeisteria crassifolia Watson. Proc. Amer. Acad. XXIV. 53. Found on an island in the harbor at Guaymas, growing near the water. Very sweet scented. **No. 165.**

Hymenatherum coccineum Gray. The type collected by Pringle at Tucson, Arizona, (1884), and we believe not since obtained. Dr. Palmer finds it very common on a sandy, gravelly plain, in exposed places. It has a strong odor. February 15 to 17, near Guaymas. **No. 168.**

Pectis Coulteri Gray. Found in sandy, gravelly plains near Guaymas, February 15 to 17. **No. 173.**

Cordia Watsoni Rose, n. sp. Besides the differences given by Mr. Watson, the following characters furnished by the mature fruit clearly set this off from *C. Greggii*: The fruiting calyx of different shape, almost globose (4 to 5 lines in diameter) and not closely inclosing the fruit, but loosely and somewhat inflated: pubescent instead of strigose: the fruit much larger, with thick, bony walls instead of thin crustaceous.

Cordia Greggii Torr., var. *Palmeri* Watson. Proc. Amer. Acad. XXIV. 61.

Mr. Watson's varietal name can not be used, as it has already been given to another species. We take pleasure in dedicating this species to him, as he has partially pointed out the difference from *C. Greggii*, and I have no doubt would have separated it at the time had the fruiting material been at hand.

No. 174.

Krynitzkia, sp. Guaymas, February 15 to 17. **No. 169.**

Phacelia scariosa Brandegee. A few plants found on the edge of an island, February 15 to 17. **No. 146.**

Nama demissum Gray. Common on gravelly plains about Guaymas, February 15 to 17. **No. 172.**

Gilia (*Eugilia*) *Sonoræ* Rose, n. sp. A small annual, 1 to 3 inches high, branching and somewhat spreading, puberulent throughout: leaves alternate, pinnate; segments linear, acute: calyx 2 lines long; sepals green, connected by scarious margins $\frac{2}{3}$ their length: corolla of the same length or a little longer, but slightly spreading, white, with a pinkish tinge: stamens included, inserted very near the base of corolla: capsule 2 lines long, seeds 16 to 18 in the cell. Grows in great profusion on sandy plains near Guaymas. Perhaps nearest *G. companulata* Gray. February 15 to 17. **No. 170.**

Cryptocarpus (?) *capitatus* Watson. Proc. Amer. Acad. XXIV. 71. **No. 175.**

Amarantus Palmeri Watson. Proc. Amer. Acad. XXIV. 71. Some very small forms collected in a garden near Guaymas, February 11. **No. 147.**

Eragrostis Purshii Schrad. Growing near water-ditch. Guaymas, February 11. **No. 145.**

Aristida bromoides H. B. K. **No. 273.**

No. 167. This is 179 of Palmer's collection, also obtained by Xantus and Brandegee. Its generic position is not known.

The leaves are narrowly to broadly linear, 3 to 5 inches long, 2 to 6 lines broad: fruit round and black.

Dr. Palmer says the tree sheds its leaves just as it is ready to bloom; the young ones appear at the ends of the branches as the flowers expand, and are full grown when the fruit is ripe. At first he was of the opinion that the shedding of the leaves was caused by the trees growing in dry, rocky places, with little or no soil, as these being in full bloom (probably brought on by the heavy rains which had fallen a few weeks before), while those in deep soil were in full leaf and had yet not shown even a flower bud. He visited Guaymas a month afterward (March 15) and found the trees growing in deeper soil were then in bloom and had just dropped their leaves also; he believes, therefore, that the falling of the old leaves at blooming is a natural character.

It is surprising that a tree of such size and of such wide distribution has for so long been and still remains unknown to botanists. A letter from Dr. Palmer of recent date (September 10th) states that he has been unable to get fruit of this plant, the dry hot wind of June having killed the young fruit.

LIST OF PLANTS COLLECTED BY DR. EDWARD PALMER IN WESTERN MEXICO AND ARIZONA IN 1890.

By J. N. ROSE.

The plants upon which this report is based were collected by Dr. Palmer, in 1890, in Mexico and Arizona. Dr. Palmer returned to Guaymas March 18, after finishing his collection at Santa Rosalia;¹ from this place he went to Alamos, remaining three weeks, and then returned to Guaymas; from here he proceeded to Arizona, staying three months, and then went to San Francisco and remained until August 23, when he again left for the Gulf of California, expecting to land at Carmen Island, but owing to some regulations of the custom officials of Mexico he was carried to Guaymas. He was planning again to visit Carmen Island,² when an opportunity offered to return to Alamos, and as he was desirous of getting the summer as well as the winter flora, he postponed the trip to Carmen Island and embarked by steamer for Agiabampo, the seaport of Alamos. This second trip to Alamos lasted two weeks, and was very successful, notwithstanding it was interrupted by a severe attack of intermittent fever, which compelled him to return to the seacoast.

The total number of new species collected by Dr. Palmer and reported in this paper is 45, with several new varieties.

The following table will show the places visited, with the date of collection and the number of plants:

Places visited.	Date of collection.	Number collected.
Alamos and Alamos Mountain.....	March 26 to April 8..	276-414 (inclusive).
Camp Huachuca, Arizona	April 26 to May 21...	416-478 (inclusive).
Willow Springs, Arizona	June 10 to 20	479-574 (inclusive).
Fort Apache	June 21 to 30.....	575-613 (inclusive).
Willow Springs.....	July 5 to 6	613-626 (inclusive).
Alamos	September 16 to 30...	627-751 (inclusive) and 812.

¹The report of this trip is to be found on pp. 80 to 87.

²It will interest those who have been following Dr. Palmer in his valuable work in lower California and Mexico, to know that he has since visited Carmen Island and made large collections at Agiabampo and in the State of Colima, which will be reported upon in a future number of these contributions.

[June 30, 1891.]

I wish to express here my thanks to Dr. George Vasey, Botanist of the Agricultural Department, under whose direction this report has been prepared, and whose ready familiarity with North American plants has been a great source of help; to Dr. Sereno Watson and his assistant, Dr. B. F. Robinson, for courtesies shown me while at Gray Herbarium; to Mr. Wm. M. Canby for the generous loaning of many plants, and for aid in difficult determinations; and to various specialists, both at home and abroad, who have given help in their separate lines, which is credited in the proper place in the text.

PLANTS COLLECTED AT ALAMOS.

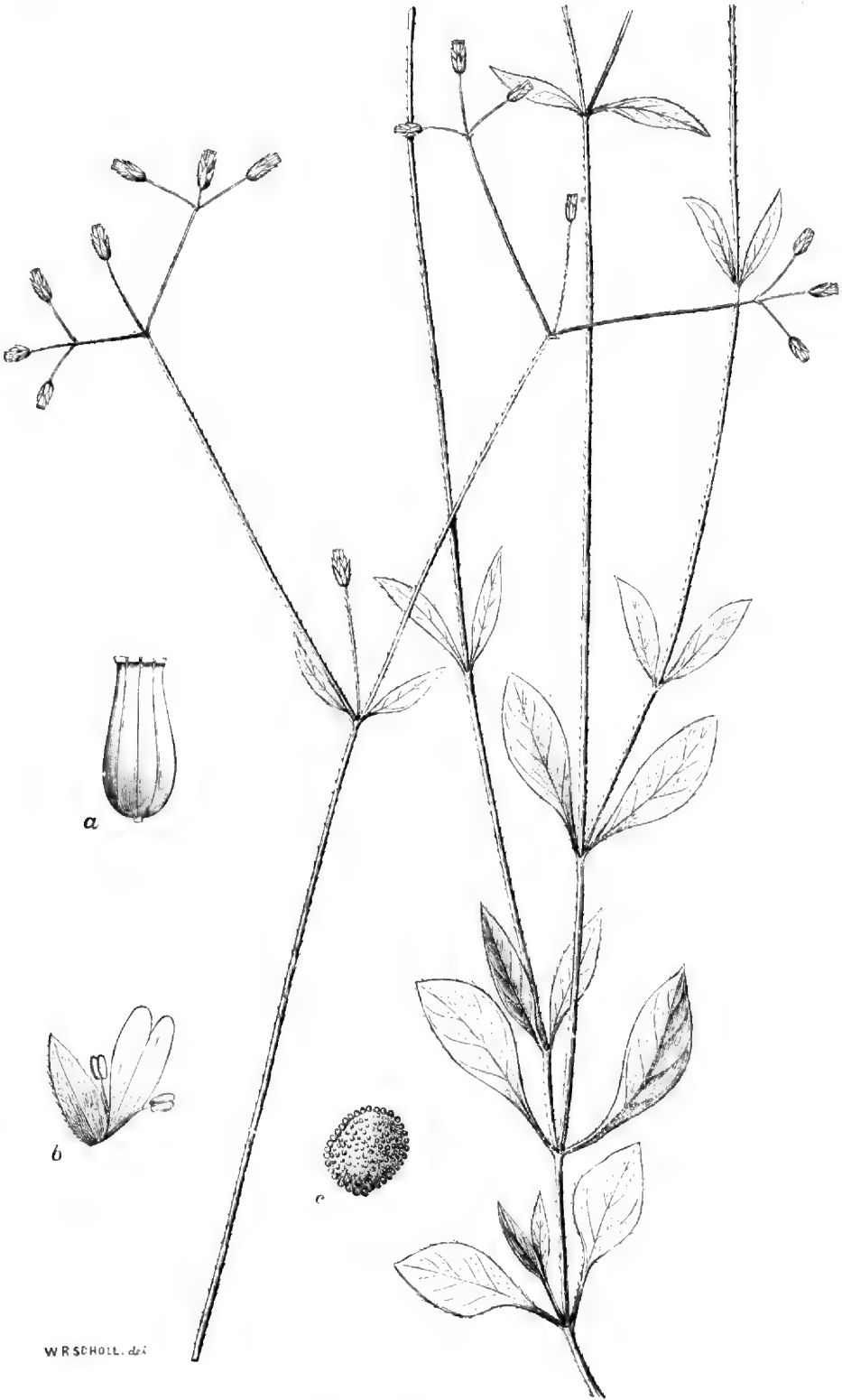
Alamos or Los Alamos is a mining town of about 10,000 inhabitants, situated 180 miles southeast from Guaymas. Its altitude is 1,275 feet above sea level. Two visits were made here, one in the dry season, March 26 to April 8; the other during the rainy season, September 16 to 30. The flora of the two seasons is very different, and only 8 or 10 species are duplicated in the two collections. The collection in the spring yielded about 130 species (Nos. 276 to 414); of these, 18 are new. The fall collection contained about 120 species, 25 of which are new. The following interesting facts are gathered from Dr. Palmer's notes. The beginning and ending of the rainy season varies somewhat; generally it commences in July and lasts until the first week of October. After the first good rains vegetation springs up as by magic, grows rapidly, then disappears nearly as quickly as it came; it is at its best in August. The soil is mostly poor and rocky except in the valley.

While at Alamos, Dr. Palmer visited the Alamos Sierra or Sierra de los Alamos, a mountain 6 miles due south of the town of Alamos. Of the 75 species collected here 13 were indeterminable; of the 62 remaining ones 18, or more than one-fourth, are new. The total number of species collected at Alamos and vicinity was 263, of which 36 were indeterminable¹, and of the 227 remaining 43 are new. Among the plants of this collection are many very beautiful ones which should claim the attention of cultivators. Of these we cite: *Heteropterys Portillana*, a recent species described by Mr. Watson. This is especially attractive for its large clusters of red fruit. It is very common at Alamos and could easily be obtained for cultivation.

Galphimia Humboldtiana, a rare plant in herbaria, is a common and attractive shrub of the mountains here. It is 6 to 8 feet high, with a handsome top, large racemes of yellow flowers, and attractive foliage.

Cordia Sonora is a new species, a very beautiful shrub or small tree, and an abundant bloomer.

¹ It is proper to state here that the reason so many of these plants are not determined is because Dr. Palmer collected a number in the dry season, which were not in a proper condition, hoping to supplement them in the rainy season; but he was unable to recollect them.



WRSCHOLL. del.

STELLARIA MONTANA, n. sp.

Tababouia Palmeri, another new species, is a conspicuous tree of this region. It grows to the height of 25 feet and produces large clusters of flowers.

Three or four of the *Ipomœas* are very attractive; one is a tree 30 feet high; another is a climbing shrub (*I. bracteata*) with large conspicuous bracts which give the plant a very showy appearance; two other new species are high climbing vines.

Clematis Drummondii T. and G. Very common, climbing over trees, bushes, and fences along water courses at Alamos. March 26 to April 8. No. 294.

Sisymbrium, sp. A little annual 3 to 5 inches high, with the foliage of *S. canescens*, but glabrous; flowers white. Seed collected at Alamos in September. Letter F. Plants grown in greenhouse at Washington. The seed is called "Pamita;" mixed with *Salvia* seed, steeped and sweetened, it forms a cooling drink.

Helianthemum glomeratum Lag. This plant grows under pines at the summit of the Alamos Mountain. March 26 to April 8. No. 342.

Polygala glochidiata H. B. K. Upper leaves alternate; flowers rose-color. Grows among grass and other plants in the shade of a wall. Alamos, September 16 to 30. No. 743.

Stellaria montana, n. sp. Slender, diffuse, about 1 foot high, glandular-pubescent: leaves $\frac{1}{2}$ to $1\frac{1}{2}$ inches long, spatulate to oblanceolate, acute to abruptly acuminate: inflorescence open; pedicels slender: sepals 5, ovate, $1\frac{1}{2}$ lines long: petals white, bifid, 2 lines long: stamens 10: styles 4: capsule a little longer than the petals, 8-cleft, the carpels rolled back: seeds numerous, tuberculate.—Moist places near water courses from the Alamos Mountain. March 26 to April 8. No. 293. A species much resembling *S. prostrata*, but with very different leaves, pubescence, etc.

EXPLANATION OF PLATE II.—The lower part of plant and a branch showing inflorescence; a, capsule; b, calyx, petal, and 2 stamens; c, seed. Dissections all much enlarged.

Fouquieria spinosa H. B. K. A small tree producing large bunches of scarlet flowers at the end of the branches. It is called "Torote Verde." The Indians and poorer people use the bark instead of soap, especially for washing blankets and woolen goods. Dr. Palmer thinks this plant is different from the Santa Rosalia plant, which I have (Cont. Nat. Herb. I. 81) referred to the above species. Near Alamos, March 26 to April 8. No. 306.

Sida Alamosana Watson, n. sp. ined. "Flowers orange-color." A single plant with few stems was found in the shade of rocks of a cañon. Alamos, Sept. 16 to 30. No. 683.

Sida cordifolia L. A foot and a half to three feet high, compact, bushy, with short and dense stellate pubescence and long silky hairs: leaves densely stellate-pubescent, about the length of the petiole or longer, 1 to $1\frac{1}{2}$ inches long, cordate, crenately-toothed; stipules long, setaceous, early deciduous: flowers on short peduncles or in small glomerate clusters: calyx 3 lines long, cleft to the middle, its lobes ovate and 3-nerved: petals glabrous, 4 lines long, creamy yellow, with a light brown or scarlet base: styles 5 or 6: carpels 5 or 6, slightly reticulated, obtuse, 1 line long.—Grows in good soil, in shade, at the base of the Alamos Mountain. March 26 to April 8. No. 301. Also, September 16 to 30. No. 752.

It differs from *S. cordifolia* in having but 5 to 6 carpels, obtuse, and reticulated, while the true *S. cordifolia* has 10 to 12 carpels hardly reticulated and either bi-arrise or bi-dentate.

Sida diffusa H. B. K. Its long stems lie prostrate upon the ground: flowers yellow. It grows on stony ridges near Alamos. Sept 16 to 30. No. 713.

Abutilon Jacquinii Don. (?) Collected near Alamos. September 16 to 30. D.

Abutilon incanum Don. Flowers lavender; common in shade of bushes and rocks along wooded hillsides; near Alamos. March 20 to April 8. No. 381.

Abutilon incanum Don. Two and one-half to three feet high; flowers very numerous and somewhat variable in color; petals mostly purple at base, but either white, orange, or purple above. A very common plant about Alamos. September 16 to 30. Nos. 650, 651, 653.

Waltheria Americana L. About 3 feet high: flowers yellow. This plant is very common on the grassy bottoms about Alamos. September 16 to 30. No. 643.

Waltheria detonsa Gray. Flowers orange-colored. A small plant about a foot high. Alamos. March 26 to April 8. No. 390.

Ayenia pusilla L. Grows sparsely in shady woods near Alamos. September 16 to 30. No. 662.

With this is a very narrow leaved form. No. 661.

Ayenia paniculata, n. sp. A shrub about 2 feet high: leaves $2\frac{1}{2}$ to 3 inches long (on petioles $1\frac{1}{2}$ inches long), oval and obtuse to ovate and acute, truncate at base and coarsely serrate; pubescence beneath white, dense, close, and stellate; above green and scanty: flowers either in the axils of the leaves or in naked panicles above: sepals brown, linear to narrowly lanceolate, $3\frac{1}{4}$ lines long: petals orbicular, 2-lobed, each lobe 2 to 3-dentate: anthers 3-celled: fruit 4 to 5 lines broad, 5 to 7-lobed, covered with short, blunt prickles, shorter than in *A. glabra*.—Very rare at Alamos. September 16 to 30. No. 644 in part.

Ayenia truncata, n. sp. Shrubby: leaves ovate, slightly acuminate, truncate at base, 1 to $1\frac{1}{2}$ inches long, crenately toothed, nearly glabrous: pedicels 3 to 4 lines long: fruit about 3 lines in diameter, clothed with a fine stellate pubescence and short blunt spines: seeds oblong, black, $1\frac{1}{2}$ to 2 lines long, less rugose than in *A. filifolia*.—Very rare at Alamos. September 16 to 30. No. 644a. It is nearest *A. glabra*, but has smaller leaves and these truncate at base and less acuminate at tip, etc.

Triumfetta semitriloba L. Grows under bushes about Alamos. September 20 to 30. No. 642.

Heliocarpus attenuatus Watson. Proc. Amer. Acad. xxi. 420. A small tree 10 feet high, 2 inches in diameter, with a compact top. On stony mountain side near Alamos. No. 732 (only in fruit). No. 647 (just past flowering).

Another plant, of which but one specimen was seen, having the leaves and inflorescence of this species, seems to be the same, but it is a small bush with white flowers and 20 stamens. Collected on a hillside near Alamos. September 16 to 30. No. 733.

Heliocarpus polyandrus Watson. Proc. Amer. Acad. xxi. 420. A large shrub 8 feet high: the stem with brown flaky bark: larger leaves, 6 inches or more long by 4 inches broad, on petioles 3 to 4 inches long: sepals $3\frac{1}{4}$ lines long, greenish yellow: petals 2 lines long: stamens 45, long and conspicuous.—Alamos. September 16 to 30. No. 629.

Bunchosia Sonorensis, n. sp. Five to ten feet high, with many woody branches; older branches glabrate and with reddish-brown bark; younger branches, leaves, and inflorescence with short soft pubescence: leaves glandless at base but with a few scattered glands on the lower surface, oval and obtuse to lanceolate and acute, $1\frac{1}{2}$ to 2 inches long: racemes 1 to 4 inches long; peduncles 3 to 8 lines long; pedicels thick, 2 lines long, in fruit 4 lines long, glandular at base: calyx small with 5 ovate lobes, bearing 10 large glands: corolla yellow; petals 3 lines long, with long claws: stamens 10, glabrous, connate at base: styles united: ovary sericeous-pubescent: drupe $\frac{1}{4}$ inch in diameter, somewhat 2-lobed, 2-pyrenous, "light amber," becoming dark red.—On level places and ridges where there is plenty of soil. Alamos. No. 322. Dr. Palmer says this plant is a large bush with numerous yellow flowers. It is considered poisonous and is not eaten by man, bird, or beast, but at night a large moth feeds upon its delicate juices.

Echinopterys Lappula Juss. The leaves of this plant are quite variable, sometimes obtuse, again the upper ones acuminate. This is the same as Palmer's Guaymas (1887) plant referred here by Watson, differing only slightly from his description. Our plant differs considerably in habit, being a climbing shrub covering the tops of surrounding bushes. Alamos. No. 404.

Galphimia Humboldtiana Benth. Dr. Palmer says: "It is the most beautiful plant of the mountain, forming a conspicuous object along the arroyos. It grows 6 to 8 feet high with one or more stems and a compact top of numerous racemes of bright yellow flowers as if polished, changing by age to light brown; this double coloring of the flowers contrasts strongly with the dark green of the leaves and gives it a just claim for cultivation." Mountains about Alamos. March 20 to April 8. No. 284.

Heteropterys Portillana Watson, Proc. Amer. Acad. XXII. 402. This species was described from flowering specimens only, and as both flowers and fruit are now at hand additional characters are here appended. Flower buds pink to rose-colored: styles 3: samara puberulent, 1 to 3 mostly 2, rarely 3, with several lateral crests; the dorsal wing 9 lines long. Dr. Palmer says the fruit, which is of a shiny brick-red color, grows in large masses, making it very attractive, and he considers it a valuable plant for cultivation. A very common plant about Alamos growing over brush and bushes especially along water-courses and in cañons. September 16 to 30. No. 655 in flower and No. 656 in fruit. The only other time it has been collected was by Dr. Palmer at Baranca, Jalisco, in 1886.

Tribulus maximus L. Called "goeonduna" and is used for the cure of insect and reptile bites. Common at Alamos but not collected; grows on rich bottom at Agiabampo. October 3 to 15. No. 786.

Tribulus grandiflorus B. & H. Flowers orange with red blotches at base. In rich bottom, common at Alamos but not collected. Agiabampo. October 3 to 15. No. 783.

Geranium sp. The single specimen is without flower or fruit. Collected in a shady ravine near the top of the mountain. No. 357.

Wimmeria confusa Hemsley, Diag. Pl. Nov. Fasc. I. 6. A large shrub or small tree, sometimes 4 inches in diameter. Alamos. September 16 to 30. No. 648.

Ceanothus buxifolius Willd., *vide* Mrs. Brandegee. Alamos Mountain. March 25 to April 8. No. 336.

Gouania Domingensis L. A climbing shrub. Plants mostly in fruit, only a few flowers were found and those were canary color. Common along cañons and water-courses. Alamos. September 16 to 30. No. 675 (flowers). No. 676 (fruit). Collected also in fruit, March 25 to April 8. No. 323.

Serjania Mexicana Willd. A climbing plant with long slender stems with scattered short prickles: flowers sweet-scented, white, in racemes 3 to 4 inches long. Dr. Palmer says the Mexicans use the stem to tie wood, grass, etc., into bundles, its strength and pliability making it very applicable for such purposes. It is called "quirote culebra." Alamos. March 26 to April 8. No. 383.

Vitis Arizonica Engelm. Probably this species. Only collected in flower. The fruit is said to be of no value. Only two plants seen. Found climbing over rocks, along a water-course, half way up the Alamos Mountain. March 26 to April 8. No. 296.

Rhus Palmeri, n. sp. Large shrub or small tree, 5 inches in diameter, 6 to 15 feet high, with large loosely-hanging top; branches puberulent: leaves pinnate; rhachis not winged; leaflets 5 to 13 mostly 9 to 11, elliptical-oblong, $1\frac{1}{2}$ to 2 inches long, acute, mucronate-tipped, appressed, pubescent: panicle terminal, 3 to 5 inches long: flowers unknown: berries glabrous, red, 3 to 5 lines in diameter, acid, very viscid.—Along a water-course half way up the Alamos Mountain, March 26 to April 8. No. 321. Although not in flower this is evidently a *Rhus* and seemingly nearest *R. juglandifolia* Willd. of Southern Mexico, but the leaflets are smaller and pubescent.

Crotalaria ovalis Pursh. Alamos. September 16 to 30. No. 712.

Indigofera Anil L. This is a small plant 1 to 1½ feet high with dark bronze colored leaves. Pods few, shorter than in our herbarium specimens, and almost straight. Collected under pines and oaks on the summit of the mountain March 26 to April 8. No. 353. Common along ravines at Alamos, March 25 to April 8. No. 311.

Hosackia Alamosana,¹ n. sp. Procumbent, rooting at the joints, glabrous or the younger parts with appressed hairs: leaves 3 to 5-pinnate; stipules 1 to 2 lines long, foliaceous, ovate, acute; leaflets obovate, obtuse, 2 to 5 lines long: peduncles slender, 2 to 4 inches long, 1 to 4-flowered, mostly 2: bracts 1, setaceous: flowers small 2 to 3 lines long: calyx tube less than a line long; its lobes almost as long and very narrow: corolla yellow: pods 10 to 15 lines long, terete, erect, 12 to 15-seeded; seeds turgid, oblong, lucid.—Half way up the mountain in a wet spot. Alamos. March 26 to April 8. No. 400. Dr. Palmer says: "The plant roots at every joint and forms a thick sod." The plant is nearest *H. angustifolia* of Mexico, but differs from it especially in its procumbent habit; its fewer and obtuse leaflets; smaller flowers and bracts. It is questionable, whether Seemann's (No. 121 of Botany Herald) broader leaved form from this same range of mountains may not really be our plant. Mr. Hemsley (Biol. Cent.-Amer. 1. 234), who has probably seen Seemann's plant, however, kept it as a possible variety of *H. angustifolia* and refers to it Parry and Palmer's No. 140, which is a very different plant from ours.

It differs from *H. repens* Don. (which species Mr. Hemsley has omitted in the Biol. Cent.-Amer.) in its fewer leaflets (1 to 3 pairs), and these not mucronulate; heads fewer flowered (mostly 2, rarely 4); and glabrous calyx.

Hosackia puberula Benth. A slender plant, under oaks and pines. Alamos Mountain. March 26 to April 8. No. 343.

Eysenhardtia orthocarpa Watson, Proc. Amer. Acad. XVII. 339. A small tree 10 to 15 feet high, sometimes 6 to 8 inches in diameter: flowers white. Called "Palo dulce." The wood steeped in water makes a sweet, refreshing drink, much relished by fever patients. In the Alamos Mountain. March 26 to April 8. No. 354.

Dalea nutans Willd. Three to five feet high, with slender hanging branches. Very common in the upper portion of the mountain. The branches are often used by the Mexicans for brooms. Alamos. March 26 to April 8. No. 385.

Dalea Wislizeni Gray. Three feet high, with drooping tendency: flowers of a bright mauve color. Not common. Collected in the upper part of the Alamos Mountain, March 26 to April 8. No. 282.

Dalea Domingensis DC. Two to three feet high: leaflets somewhat larger than in type. Only a few plants seen near Alamos. March 26 to April 8. No. 380. Also September 16 to 30. Letter C.

Dalea calycosa Gray. It grows on stony ridges close to the ground, almost hidden from view in the grass. Flowers white at first, becoming pinkish when drying.

Dalea lævigata Gray. (?) Four to five feet high, without leaves: flowers white. Very common in the mountain. Dr. Palmer says that the branches are made into brooms by the Mexicans and sold in the markets at Alamos. March 25 to April 8. No. 853.

Dalea Parryi Torr. and Gray. A loose growing plant about 3 feet high. Common on hillsides about Alamos. September 16 to 30. No. 739.

Brongniartia podalyrioides H. B. K. A shrub 8 to 10 feet high, 3 to 4 inches in diameter: leaflets 5 to 7 pairs. Alamos. September 16 to 30. No. 658.

It differs from *B. galegoides*, which it resembles somewhat in the flowers being axillary not racemose; the leaflets larger, with cuneate base.

¹If *Hosackia* is to be referred to *Lotus* as advocated by Mr. E. L. Greene, Pitt. II. 133, this should be *L. Alamosanus*.



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DIPHYSSA RACEMOSA, n. sp.

Brongniartia Palmeri, n. sp. Shrub, $1\frac{1}{2}$ to $2\frac{1}{2}$ feet high, glabrous; branches villous-pubescent: leaves 2 to 3 inches long; stipules large, 6 to 8 lines long, ovate; leaflets 6 to 8 pairs, oblong, appendiculate, glabrous above, with villous hairs along the margins and midrib below: inflorescence in a terminal raceme; flowers mostly 3 to 5 in the axils of stipular bracts: peduncles 9 lines long, enlarged below the calyx: calyx 6 lines long; its two upper lobes high connate: petals purplish: pods $1\frac{1}{2}$ to $2\frac{1}{2}$ inches long, glabrous and glaucous, oblong, tapering at base, 3 to 6-seeded: seeds 3 to 4 lines long.—Rare, only a few plants seen near the base of the mountain. Alamos, March 26 to April 8. No. 300. In *B. galeoides* the upper bracts are small, leaflets larger, etc.

Diphyssa racemosa, n. sp. Five to ten feet high, the younger parts, foliage and inflorescence, very viscid, granular: leaflets 9 to 17, oblong, small, 3 lines or more long: racemes axillary 8 inches or more long: pedicels 4 lines long: 2 bractlets at base of flowers, oval, 3 lines long: calyx about 6 lines long, the slender tube below the disk 2 lines long: legume on a stipe 6 lines long, oblong, $1\frac{1}{2}$ inches long, $\frac{3}{4}$ inch broad.—Hill-slopes, in deep soil near Alamos. March 26 to April 8. No. 295. The wood is very hard and yellowish, covered with a dark-brown bark abundantly spotted with many horizontal lenticles. This is both in flower and fruit. It is almost gummy and emits a most disagreeable odor.

EXPLANATION OF PLATE III.—Shows racemes and foliage; a, legume; b, section of stem with lenticles. All natural size.

Coursetia glandulosa Gray. A large scraggy bush with several stems. The stems are often covered with a thick coating of gum. Dr. Palmer says it has great medical value. The gum dissolved in water with sugar is used as a drink in cases of colds and fevers, and as a remedy for consumption it is highly extolled. It is sold in the drug stores at a dollar per pound, under the name of "Guma Sonora." The plant is known as "Samo prieto." It grows at the base of the mountains in the gulleys. Alamos. March 26 to April 8. No. 333.

Willardia, n. gen. Calyx truncate with small equal teeth. Petals equal; vexillum orbicular spreading; wings falcate-oblong; keel slightly incurved. Vexillary stamen connate into a tube with the others except at base; anthers uniform. Ovary sub-sessile with several ovules; style incurved, glabrous or with a few hairs at base; stigma capitate, minute. Legume linear-oblong, strongly compressed, continuous within: seeds reniform, strongly compressed. A small tree: leaves imparipinnate; leaflets definite, entire, exstipellate. Stipules obsolete. Racemes axillary. Flowers "lilac."

This plant was first named and described as a *Coursetia* by Dr. Watson, to which genus it is closely related. The type specimens, however, were only in fruit and it was doubtfully referred as above. The collection by Dr. Palmer of an abundance of flowers shows a still greater divergence and demands the establishment of a new genus.

It differs from *Coursetia* especially in its truncate calyx and glabrous style. Its position, however (according to Dr. P. Taubert¹), seems nearest *Lennea*, from which it differs in its style and more membranaceous pod.

It resembles *Sabinea* in its calyx but differs in having racemes of flowers, and also from this as well as all the other *Robinieæ* except the above two, in its connate stamens.

At the request of Dr. Edward Palmer I have named this genus for his old and valued friend, Hon. Alexander Willard, who for twenty-five years has represented our Government as consul at Guaymas, and has aided Dr. Palmer with his various collections from this region.

¹ I am under many obligations to Dr. P. Taubert, of Berlin, who is preparing and will soon issue the Leguminosæ in Die Natürlichen Pflanzenfamilien, for confirming my observations and adding new information.

Willardia Mexicana. Small trees 10 to 30 feet high, very straight, with smooth bark and 1 foot or more in diameter: leaves (only a few of the old ones remaining) 4 to 7 pairs, oblong-elliptical, obtuse at each end or subemarginate, 8 to 15 lines long, 6 to 8 lines broad, finely and softly pubescent, especially beneath: racemes somewhat paniculate many-flowered: ¹ calyx 2 lines long with very short teeth: petals 5 lines long: stamen tube truncate at apex: ovules 8 to 10, pods very thin, narrowed at each end, 2 to 5 inches long, 4 to 6 lines wide, more or less constricted, dehiscent: seeds 5 lines long, smooth and shining, pale salmon color. —In flower March 25 to April 8 (No. 332), in fruit September 16 to 30 (No. 717). Also collected in SW. Chihuahua in 1884 by Palmer. *Coursetia* (?) *Mexicana* Watson. Proc. Amer. Acad. **xxi.** 424.

Called "Nesco" or "polo piojo."

Common in the Alamos Mountain, where it is much used by the miners for "props." Only two trees seen near the base of the mountain. The trees near the settlements are mostly destroyed.

Desmodium plicatum Schl. and Ch. The plant has two or three slender stems and a few loose, hanging branches: racemes axillary or terminal, 6 to 8 inches long: flowers in verticillate clusters, crimson, becoming dark purple when dry. On the side of a ravine in the upper portion of the Alamos Mountain. March 26 to April 8. No. 347. We have not seen a description of this plant, but it corresponds with Bourgeau's plant referred here by Hemsley.

Rhynchosia precatória DC. (?) This plant seems to belong to this species and to be different from *R. phaseoloides*, to which it is often referred by authors. The latter species can be distinguished by its glabrous shining pods and large flowers. Several very similar forms have been referred to *R. phaseoloides* by Mr. Watson, and while the two, as represented in the National Museum, seem distinct, a fuller representation may show they are the same species. Along a river bank near Alamos: March 26 to April 8. No. 378.

Eriosema grandiflorum Seem. About 1 foot high. Only a single plant seen. At the base of the Alamos Mountain. March 26 to April 8. No. 360.

Nissolia Schottii Gray. A climbing shrub, glabrous, leaves alternate; leaflets 5, thin, oblong to obovate (6 to 10 lines long), obtuse with appendiculate tip: flowers axillary, 2 to 5 (?) in a cluster: fruit 10 lines long, 1 to 2-seeded. This shrub was found climbing over fences, etc., about Alamos. September 16 to 30. No. 638.

Piscidia mollis, n. sp. Apparently a second species of this genus. A tree 15 to 25 feet high, a foot in diameter: leaves 11 to 13 pinnate; leaflets elliptical or broad lanceolate, acute, hoary, veins prominent beneath, indistinct above: fruit 4-winged, 2 somewhat abortive.—Common on ridges and plains about Alamos. March 26 to April 8. No. 355. Called "palo blanco," from the excessively white appearance of the tree.

Parkinsonia aculeata L. Called "Guacoporo." A shrub 10 to 15 feet high. Common along river banks, ravines, etc. Alamos. March 26 to April 8. No. 375.

Cassia Tora L. One of the commonest plants of the region and found everywhere in waste places, especially in sandy soil. Alamos. September 16 to 30. No. 738.

Cassia biflora L. One to one and a half feet high. Grows on wooded hills about Alamos. March 26 to April 8. No. 393. September 16 to 30. Letter B.

Cassia emarginata L. A small tree 10 to 15 feet high, with a very large top. The abundance of orange-colored flowers makes it an attractive tree. This is the same as Palmer's No. 210, Chihuahua, 1885. Near Alamos. March 26 to April 8. No. 299.

¹All the flowers were more or less infested by a little encysted insect which Mr. L. O. Howard has described as a new genus *Tanaostigma*. For a description and an interesting account of this insect see *Insect Life*, vol. **ii.**

Mimosa (Leptostachyae) Palmeri, n. sp. Large, bushy shrub, 8 to 10 feet high, thornless or with a few infra-stipular spines; the younger branches fuscous-pubescent: leaves large, with setaceous stipules; rhachis 4 to 8 inches long, deeply grooved; pinnae with small stipels, 6 to 16 pairs, oblong-oblique $1\frac{1}{2}$ to $2\frac{1}{2}$ lines long, appressed pubescent above and below: spikes (2 to 4 inches long) axillary or racemose, corolla pinkish, its lobes pubescent and spreading: stamens 10: ovary with reddish-brown pubescence, tipped with a long, slender style.—This shrub was only found in flower, and these mostly in terminal racemes 6 to 8 inches long. The buds and flowers are pink and very showy and sweet-scented. Near Alamos. September 16 to 30. No. 628. This plant comes nearest to *M. Wrightii*, but with larger and more open leaves and with different pubescence.

Acacia pennatula Benth. In these specimens the peduncles are very short (3 to 6 lines long), while those of Pringle from Jalisco (1889), referred here by Mr. Watson, have peduncles sometimes $1\frac{1}{2}$ inches long. No fruit accompanies these specimens. Commonly called "Algaroba." It is a small tree with a very broad top. The flowers are very numerous, orange-colored, and very fragrant.

Acacia malacophylla Benth. var. *microphylla* Watson. Our plant seems to be the same as Pringle's Sonoran specimens collected in 1884. We have not seen Mr. Watson's description of this variety. Dr. Palmer says it is a small tree resembling the mesquit. It is nearly exterminated; about settlements it is much used for fuel. Near Alamos. March 26 to April 8. No. 315.

Acacia (?) sp. A large bushy shrub with several stems, 8 to 10 feet high, with a large top, somewhat thorny: pinnae 4 to 8 pairs; leaflets 8 to 10 pairs, oblong, 2 to 3 lines long: heads on peduncles $\frac{1}{2}$ inch long: pods with 6 to 10 deep constrictions, margin thick and breaking away from the valves. Alamos. September 16 to 30. No. 627. This shrub is probably of this genus, but as it is only in fruit its generic position is doubtful. The pods seem to ally it with *A. constricta*.

Leucaena lanceolata Watson., Proc. Amer. Acad. xxi. 427. A large bushy shrub 8 to 10 feet high, glabrous or nearly so throughout: pinnae 4 to 6 pairs with a small gland between or at the base of the upper pair; leaflets 3 to 6, glabrate or nearly so: pods erect, 6 inches long tapering at base into a stipe (6 to 8 lines long) glabrous, marked with cross partitions. *L. lanceolata* was described from flowering specimens and ours is in fruit. It seems nearest that species but differs from the description in most of the above particulars and lacks the large gland on the petioles. In a cañon near Alamos. September 16 to 30. No. 718.

Lysiloma Watsoni, n. sp. A small tree 10 feet high, 3 inches in diameter; branches, rhachis and leaflets densely cinereous-pubescent: leaves large; rhachis 5 to 6 inches long; pinnae 8, 2 to 5 inches long; leaflets 30 to 45, thick, oblong, 2 to 4 lines long, obtuse, with midrib somewhat excentric: legumes single or two or three in a cluster, oblong, 5 to 8 inches long, 10 to 12 lines broad, tapering at base into a stipe, 6 to 12 lines long and abruptly narrowing into a spiny tip 6 lines long; the exocarp first breaks away from the persistent margin: seeds oblong-oval, $4\frac{1}{2}$ lines long, brownish with a darker elliptical mark on each side. Alamos. September 16 to 30. No. 664.—Dr. Palmer says this tree has a symmetrical top. It was only seen in fruit. With this species I am inclined to refer Palmer's No. 88 (1886) from Baranca of the State of Jalisco referred to "*Lysiloma* (?) sp." by Mr. Watson in Proc. Amer. Acad. xxii. 410. Palmer's No. 88 is simply in flower and the leaflets, immature, are smaller and described as glabrous. Even in fruiting specimens there is considerable difference in the size of the leaflets. The pubescence is developed by age. No. 88, which appears to be glabrous even under an ordinary lens, shows under the high power the nascent pubescence. The stipules are wanting in my specimens, and the tips of the leaflets are a little different from Mr. Watson's specimen but in other respects it seems to be the same. This well-marked new species belongs to Mr. Bentham's second section of this genus. It may well bear the name of Mr. Watson, who has characterized but not named the species.

Lysiloma Acapulcensis Benth., var. *brevispicata*, n. var. A large tree, 30 to 40 feet high, 1 foot or more in diameter: spikes very short, 6 to 10 lines long.—Our specimens are without fruit but seem to differ from this species only in the very short spikes of flowers. Near Alamos. March 26 to April 8. No. 317. Palmer's plant from Jalisco (1885) is a shrub only 12 feet high. Pringle (1889) has collected the species in fruit from the same region. The trees are fast disappearing. Dr. Palmer says it resembles the Mesquit and is a good durable wood and makes a fine shade tree. Called "Tepehuaje."

Pithecolobium Mexicanum, n. sp. Small tree, 15 to 20 feet high, 1 foot in diameter: leaves with straight stipular spines (sometimes wanting) 1 line long; pinnae 2 to 5 pairs; leaflets 5 to 10 pairs, oblong, 2 to 4 lines long, midribs a little eccentric, puberulent, as is also the rachis and branches: inflorescence paniculate; flowers in heads, pedicellate; pedicels 1 to 2 lines long; calyx $\frac{1}{2}$ line long; corolla $1\frac{1}{2}$ lines long; the petals spreading or reflexed: stamens long, numerous: legumes oblong, somewhat constricted, 3 to 4 inches long, 1 inch broad, straight, its valves not elastic nor revolute: seeds 2, oval, 2 to 4 lines long.—In the Alamos Mountain. March 26 to April 8. No. 297. Seeming nearest *P. albicans* Benth., but peculiar in its pedicelled flowers. Commonly called "Chino." The tree has much the habit of the Mesquit and is valuable for its wood; it is now rarely seen and is fast becoming exterminated.

Sedum Alamosanum Watson. Proc. Amer. Acad. xxv. 148. This is the type, the descriptions being drawn from the vegetative plant. The floral characters are here appended: Racemes 2 to 8-flowered: flowers pinkish; sepals 1 line long: petals $1\frac{1}{2}$ to 2 lines long: stamens 10. Collected on the side of a ravine, half way up the mountain. Alamos. March 26 to April 8. No. 273.

Gronovia scandens L. This plant climbs over bushes and to the tops of the highest trees. Alamos. September 16 to 30. No. 630.

Cuphea calcarata Benth. (?) Alamos. September 16 to 30. No. 729.

Schizocarpum Palmeri Cogniaux and Rose, n. sp. Stem long and slender with short close pubescence, intermixed with long scattered hairs, or becoming glabrate: leaves 1 to 4 inches long, on petioles of about equal length, entire to deeply 3-lobed: male flowers on peduncles 1 inch or more long, large, solitary, axillary, yellow; calyx short, tubular below, its lobes filiform; corolla funnel-form; stamens 3 with distended filaments and with anthers elongated, more or less curved; pistil none: fertile flowers subsessile; calyx and corolla as in male-flower; ovary glandular-pubescent, oblique, oblong, long rostrate, two-celled, each cell with 10 locelli in two rows; style slender 2 to 3 lines long, with large bilobed stigma; ovules in the locelli, solitary ascending (!); fruit $1\frac{1}{2}$ inches long, turgid, ovoid, indehiscent or bursting irregularly, glabrous; seeds 3 to 4 lines long, glabrous, black, flattened, tapering to an obtuse apex.—Climbs over fences and bushes along water-courses and in cañons near Alamos. September 16 to 30. No. 725.

Echinopepon¹ *cirrhopedunculatus*, n. sp. Stems slender, climbing over bushes, glabrous except a bunch of white hairs at the nodes: leaves variable from orbicular with deep sinus and shallow lobes, to ovate with deep lobes and almost truncate base; the lobes and apex spiny tipped; the upper surface white papillose with short spiny hairs on the veins, below somewhat scabrous; petiole about the length of the leaves, spinescent with a cluster of white hairs at the base of the

¹ There is still considerable difference of opinion among botanists as to the claims of this group to generic rank. As held by Cogniaux and other distinguished botanists this should be referred to *Echinocystis cirrhopedunculata*. He says, however, there is reason for either course—"vous verrez que j'ai été longtemps indécis avant de réunir ces deux genres dans ma monographie: on peut donner de bonnes raisons pour la réunion, et aussi pour la séparation." Still others would refer this to *Micrampelis cirrhopedunculata*, claiming that Rafinesque's genus should be substituted for *Echinocystis*. See Pitt. II. 127, etc.



ECHINOPEPON CIRRHOPEDUNCULATUS, n. sp.

blade sterile flowers on racemes with slender peduncles longer than the leaves: pedicels filiform 6 to 9 lines long: flowers small ($1\frac{1}{2}$ to 2 lines broad), white, anthers 5, with straight cells: female flowers solitary on long thread-like pedicels (3 to 6 inches long) which coil like a tendril: fruit including the beaked operculum (glabrous, deciduous) 8 lines long; the base covered with long slender spines: cells 2, each containing 2 seeds: seeds ascending, $2\frac{1}{2}$ lines long.—Common about Alamos, climbing over bushes and fences. September 16 to 30. No. 634. A peculiar species in its long cirriform peduncles. Prof. A. Cogniaux, who has kindly looked over my plant, makes the following note: Votre *Echinopepon* nouveau est bien curieux et diffère beaucoup de tous les autres, surtout par son très-long péduncule filiforme. Je crois qu'il faudra le placer près de mon *Echinocystis torquata* (Monogr., p. 803), avec lequel il n'a cependant pas trop de rapports.

EXPLANATION OF PLATE IV.—The plant is shown natural size; *a*, seed; *b*, flower; both much enlarged.

- Sicyosperma gracile** Gray. This plant is found along water-courses, climbing over bushes and fences. Alamos. September 16 to 30. No. 723.
- Sechiopsis triquetra** Naud. Alamos. September 16 to 30. No. 736.
- Begonia Palmeri** Watson. Proc. Amer. Acad. xxi. 429. Leaves not lobed: flowers white. Grows in a mountain cañon near Alamos. September 16 to 30. No. 708.
- Cereus**, sp. About 4 feet high: flowers salmon-colored, very numerous. Quite common at Alamos. March 26 to April 8. No. 335.
- Eryngium nasturtiifolium** Juss. The fruit of this species is covered with small, linear scales, except at the top; here they are broad, ovate, mucronate; the apex is extended into a beak as long as the ovary. Only a few plants found in moist places near Alamos. March 26 to April 8. No. 302.
- Aralia pubescens** DC. ? Tree-like plant 5 to 7 feet high, $1\frac{1}{2}$ inches in diameter with thick corky bark; branches few, horizontal: branches and inflorescence puberulent: racemes terminal, compound, 3 to 6 inches long: styles 5, tardily separating: fruit 2 lines in diameter. Alamos Mountain. March 26 to April 8. No. 351. *A. pubescens* has been considered by Benth. & Hook., Gray and Watson, and most other writers as simply a form of *A. humilis* and our plant may properly belong to that species. In the absence of leaves, however, it is difficult to decide just what species it is, and if distinct from *A. humilis* I am not altogether sure that it is *A. pubescens*.
- Chiococca racemosa** L. An upright-growing shrub, 6 feet high. The leaves are somewhat smaller than any specimens in the National Herbarium. Grows on hillside near Alamos. Sept. 16 to 30. No. 735.
- Spermacoe asperifolia** Mart. & Gal. Collected near Alamos; without number (distributed under letter C). Sept. 16 to 30. Said to have been obtained in March also, but specimens are lost.
- Vernonia** (?) Palmeri, n. sp. A bush with many stems, 4 to 5 feet high, closely sericeous-pubescent: leaves lanceolate, 3 to 6 inches long, entire: inflorescence forming large pyramidal clusters: involucre cylindrical, or 3 or 5 series of bracts: corolla white with slender proper tube and narrow lobes: akenes turbinate, pubescent.—Alamos. March 26 to April 8. No. 387. Very abundant half way up the mountain side.
- Stevia trifida** Lag. Only a few plants seen. Found near a water-course half way up the Alamos mountain. March 26 to April 8. No. 287.
- Stevia subpubescens** Lag. One to two feet high, bushy: flowers white. High part of the mountain under shade of oaks and pines. Alamos. March 26 to April 8. No. 386.
- Eupatorium**, sp. About 2 feet high: leaves 1 to $1\frac{1}{2}$ inches long, ovate, slightly toothed, under surface densely covered with minute glands: involucre cylindrical, with 3 or 4 rows of closely imbricated bracts. Only found half way up the mountain. Alamos. March 26 to April 8. No. 359.

- Eupatorium pauperculum** Gray. Stem 18 inches to 2 feet high: inflorescence corymbose: flowers creamy white; proper tube of corolla long and slender. Grows in shade upon the upper part of the Alamos Mountain. March 26 to April 8. No. 281. According to Syn. Flora it is credited to Pringle alone from Arizona, but Parish collected it at Lowell, and Lemmon (Nos. 183 or 201) in 1881 found it at Santa Catalina Mountains, and distributed it as *E. pycnocephalum* Less.
- Eupatorium Palmeri** Gray. Proc. Amer. Acad. xxi. 383. Collected by Palmer in 1885 and recently (1890) by Pringle.
- Barroetia subuligera** Gray. Leaves serrate, not crenate. Alamos. Sept. 16 to 30. No. 677.
- Brickellia Pringlei** Gray. The plant grows from 1 to 1½ feet high; rare. Found in the higher part of the Alamos mountain. March 26 to April 8. No. 286.
- Brickellia diffusa** Gray. Found in the shade on the bank of a creek. Alamos. Sept. 16 to 30. No. 812.
- Aster tanacetifolius** H. B. K. Common on grassy creek bottoms. Alamos. Sept. 16 to 30. No. 654.
- Erigeron Alamosanum**, n. sp. Slender annual a foot or so high, simple, or more or less branched, slightly hirsute and granular: radical and lower leaves ovate to broadly spatulate, remotely toothed; upper leaves narrowly spatulate to linear: peduncles filiform: involucre 1 to 2 lines long, its bract slender, acute, with scarious margins and a brown gland along the back: rays about 50, slender, violet. —Grows half way up the mountain side in shade of rocks. Alamos. March 26 to April 8. No. 348. This is nearest *E. divergens*, but it has different pubescence, smaller heads, and fewer rays.
- Baccharis glutinosa** Pers. Six to eight feet high. Common along water-courses near Alamos. Sept. 16 to 30. No. 719.
- Lagascea decipiens** Hems. A common loose-growing plant 5 feet high: flowers orange-colored. Near Alamos. March 26 to April 8. No. 401.
- Gnaphalium Sprengelii** Hook and Arn. Collected near the top of Alamos Mountain, March 26 to April 8. No. 349. What appears to be the same species found Sept. 16 to 30. No. 678.
- Milleria quinqueflora** L. This plant is about 3 feet high. It grows along water courses in dense shade. Alamos. Sept. 16 to 30. No. 722.
- Guardiola platyphylla** Gray. A bushy shrub about 3 feet high. Common on the gravelly beds just above the river near Alamos. March 26 to April 8. No. 280.
- Melampodium cupulatum** Gray. Common along ravines, on hillsides, and in cañons. Alamos. September 16 to 30. No. 726. Also common at Agiabampo. It seems to have been collected by Palmer in 1869.
- Franseria cordifolia** Gray. A plant known only from the collections of Pringle & Parish. Dr. Palmer reports it as very common about Alamos on wooded hillside. It grows about 2 feet high and is quite bush-like. The young stems show an intense whiteness which disappears, somewhat, in drying. Alamos. March 26 to April 8. No. 391.
- Tragoceros Mocinianus** Gray. Proc. Amer. Acad. xxi. 388. Flowers creamy white. Very common on sandy bottoms and in cañons, but has only been collected before by Palmer in SW. Chihuahua in 1885. Pringle's No. 2450 from Jalisco distributed as this species answers better to *T. microglossus* DC. Alamos. September 16 to 30. No. 646.
- Zinnia linearis** Benth., var. *latifolia*, n. var. Low and somewhat spreading: leaves broader, lanceolate, 1 to 1½ inches long, 2 to 4 lines broad, 3-nerved: rays few, always 7: akenes with 2 unequal awns.—Alamos. March 26 to April 8. No. 352. Only a single specimen found near the base of the mountain. Although this plant does not seem to answer very well for *Z. linearis*, yet it is very similar in the color of the flowers and in its akenes, but on account of the scanty material it seems best to make it a form of this species.

Sclerocarpus spatulatus, n. sp. Several feet high with widely spreading branches: leaves alternate, 3 to 5 inches long including the petioles, coarsely serrate, a little scabrous above, appressed-pubescent below: involucre bracts 3 to 6 lines long, hirsute: rays yellow: central disk-flowers sterile.—Very common in woods and along streams about Alamos. September 16 to 30. No. 649.

Montanoa, sp. Three feet high with several stems: leaves opposite, ovate-lanceolate 3 to 5 inches long by 2 inches broad, acuminate, 3-nerved, sub-entire, hispid above, villous-pubescent beneath: involucre bracts very small (2 lines long) mucronate: chaffy bracts large (6 lines long), glabrous, with mucronate tip reflexed: rays not seen: disk-corolla 2 lines long; proper tube slender (1 line long), swollen at base, abruptly enlarged into the long slightly puberulent throat: style with bulbous base, hardened in age, attached or deciduous from the akenes: akenes glabrous, top-shaped, $1\frac{1}{2}$ lines long, without pappus.—Alamos. March 26 to April 8. No. 361. A single plant found half way up the mountain side. It is called "Bolallaqui;" it exudes from the stem a gum which is much valued by the common people for its healing properties. Although the number of rays is not known, it clearly belongs to De Candolle's § *Acanthocaphae*. By comparing the flowers with those of *M. grandiflora* (Palmer's No. 492 of 1886), I find that the corolla is shorter and less pubescent and the latter lacks the bulbous style. *M. subtruncata* Gray has still shorter corolla ($1\frac{1}{2}$ lines long) with a very short proper tube and a more abrupt throat, but possesses the bulbous base of our plant. The akenes of *M. subtruncata* have a thick margin forming a low crown which is not possessed by the other two. *M. patens* has a corolla and akene with crown similar to *M. subtruncata*, but with or without a small bulbous style-base. There seem to be very good specific characters in the structure of the disk-flowers.

Montanoa (Enocoma), sp. Large, loose shrub, 8 to 10 feet high: leaves 2 to 6 inches long (including the $\frac{1}{2}$ inch petiole), lanceolate, with acuminate tip and cuneate base, scabrous above, hirsute below, coarsely serrate or sub-entire: flowers in corymbose clusters: pedicels slender, hairy: involucre in one series of about 5 bracts: rays 2 to 4, very small, white: disk-flowers 3 to 5: chaff very hairy on the back, narrowed into a mucronate tip. Alamos. March 26 to April 8. No. 394. This is a loose-growing shrub with many stems, and the habit of the elder.

Zexmenia podocephala Gray. About 3 feet high. Only a single plant seen near the base of the mountain. Alamos. March 26 to April 8. No. 363.

Zexmenia fruticosa, n. sp. Upright shrub, 8 feet high: leaves lanceolate to ovate-lanceolate, 2 to 4 inches long sharply serrate, scabrous: heads terminating the branches, or in corymbs of 3 to 5: involucre bracts in 2 or 3 series, imbricate, hispid: rays small, yellow: akenes slender, 2 lines long, with awns as long or longer.—Common along streams and on mountain side about Alamos. September 16 to 30. No. 645.

Viguiera montana, n. sp. Two to three feet high, slender, scabrous: leaves opposite (except some upper bract-like ones), linear-lanceolate, 4 to 5 inches long by 3 to 7 lines broad, acuminate, sessile, 3-nerved, scabrous above, prominently reticulated below: head turbinate, 6 lines long, with bracts closely imbricated in 5 or 6 series: bracts oblong, obtuse, or abruptly mucronate, conspicuously ciliate, with soft white hairs: rays small, oblong, 5 or 6: disk-flowers 2 lines long: akenes 2 to $2\frac{1}{2}$ lines long, villous-pubescent: pappus conspicuous, with two unequal awns and with several intermediate paleæ, lacinate, a line long.—Near the summit of the mountain, under shade of oaks; at the time of gathering, almost past blooming. Alamos. March 25 to April 8. No. 340. A peculiar *Viguiera*, differing from all other species we have examined, in its many series of imbricating involucre bracts; in this respect it is most like *V. Purisima*. The stems are slender and purplish and the base has a tuft of wool as in the native species of *Perezia*. Alamos. March 30 to April 8. No. 340. It resembles *V. blepharolepis*, but the heads are smaller, bracts more numerous and glabrous on the back.

Tithonia Palmeri, n. sp. Four to six feet high, more or less hispid-pubescent: lower leaves very large, over 1 foot long, 10 inches broad with a somewhat cordate base; upper leaves oblong with truncate or cuneate base coarsely serrate; petioles more or less winged, scabrous and hispid-pubescent: heads on long peduncles (little thickened above), small, 6 to 9 lines long: involucre bracts about 2 series, short; the outer ones narrow and acute; the inner ones broad and obtuse: akenes 3 lines long, with 1 or 2 awns and 3 intermediate paleæ: rays oblong, 6 lines long, "yellow to orange."—Along water-courses and in cañons. Alamos. September 16 to 30. No. 721. It resembles *T. tagetifolia*, but with different pubescence, involucre, rays, and pappus.

Tithonia (?) **fruticosa** Canby and Rose, n. sp. Shrubby, 5 to 10 feet high; younger part silky-pubescent: leaves alternate, lanceolate, acuminate, 6 to 8 inches long (including the petioles) cuneate at base, slightly crenately-toothed, somewhat reticulated and soft pubescent below; appressed and somewhat scabrous above: heads on short axillary or terminal peduncles, 1 inch high: involucre campanulate of 3 or 4 rows of broad, oblong, and obtuse bracts: ray-flowers pistillate and sterile, 12 to 15, the slender ligules $1\frac{1}{2}$ inches long: akenes 3 lines long, pubescent: pappus composed of united scales forming a short crown.—Only two plants seen. Among bushes near a water-course. Alamos. March 26 to April 8. No. 303. Dr. Palmer says that at a distance this plant appears to be a beautiful shrub, with numerous, large, bright-colored flowers. The stem is 4 inches in diameter at the base and the wood resembles the Elder. This species is very different from the rest of the genus in its tall shrubby habit.

EXPLANATION OF PLATE V.—A branch showing leaves and head; natural size; a, section of woody stem.

Encelia Mexicana Mart. Flowers yellow, somewhat pinkish on drying. Grows along the creek bottom near Alamos. September 16 to 30. No. 741.

Bidens (**Psilocarpæa**) **Alamosana**, n. sp. Perennial; 4 feet or less high, glabrous throughout: leaves mostly 3-parted, sometimes 5-parted, upper ones often simple; segments lanceolate, 2 to 3 inches long, acute, cuneate at base, sharply serrate with erect teeth: heads broad, 6 to 9 lines long: rays broadly oblong, 6 to 8 lines long, sterile (as in most of the species): disk-flowers 5 to 6 lines long: anthers yellow: style-branches broad, abruptly tipped with a linear appendage: ray-akenes abortive, 2-awned; disk-akenes very slender, 5 to 9 lines long, 4-angled, glabrous, becoming curved outward and with 4 to 5 retrorsely barbed awns.—Very rare; in the shade along a water-course near Alamos. March 26 to April 8. No. 278. September 16 to 30. Letter E. Dr. Palmer says it is a loose grower with many branches and abundant flowers, which have the strong odor of the marigold.

EXPLANATION OF PLATE VI.—Plant natural size; b, akene much enlarged.

Calea scabrifolia Benth. and Hook. A plant with two or more stems from the base, about 2 feet high: largest leaves 5 inches long and 2 inches broad: "flowers white:" ray-akenes without pappus: disk-akenes 1 line long. Along ravines in the higher portions of the Alamos Mountain. March 26 to April 8. No. 283. With this should be combined *Perymenium album* Watson.

Perityle effusa, n. sp. Slender annuals, much branched, more or less glandular or glandular-pubescent with some villose hairs: leaves mostly opposite, a few alternate, more or less deeply cleft: heads small: rays small, numerous, white: disk-flowers yellow with slender proper tube gradually passing into the throat: style-branches slender, acuminate-tipped: akenes small, $\frac{3}{4}$ line long, oblong, straight or slightly curved, with callose and villose margin; pappus a delicate paleaceous crown, with two short unequal awns.—In the shade half way up the mountain near Alamos. March 26 to April 8. No. 350. Also very common along the river bank. No. 377. It has also been collected by Palmer in southwest Chihuahua (No. 238, 1885); and by Pringle in southern Arizona, 1882.

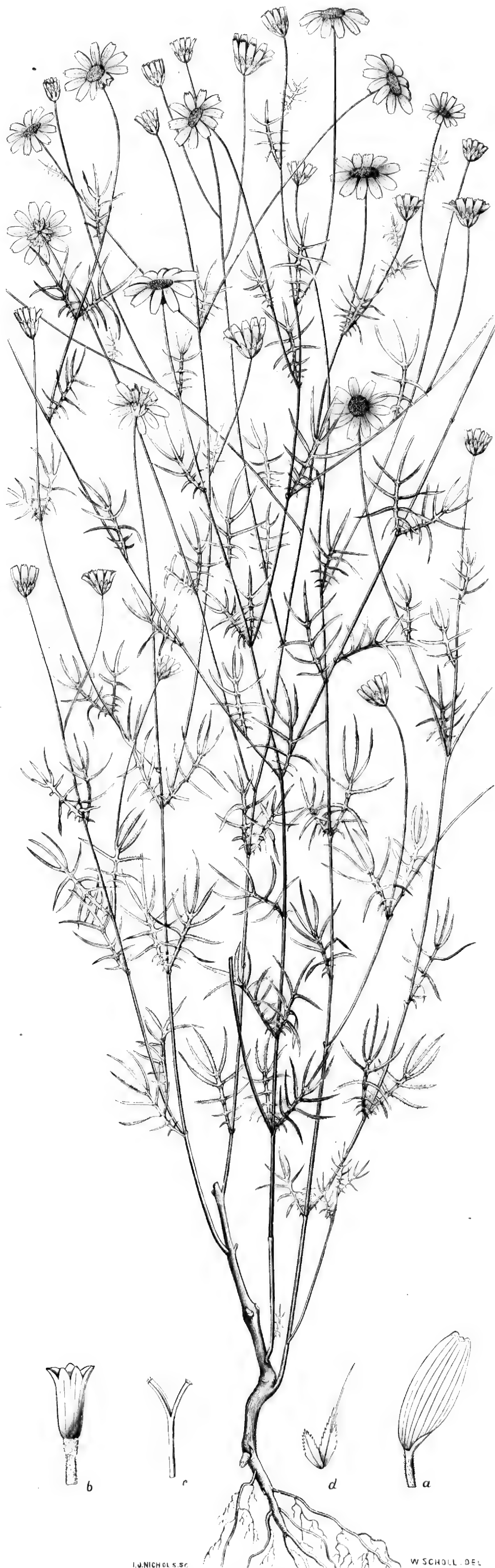


W. SCHOLL DEL.

TITHONIA FRUTICOSA, L. DC.



BIDENS ALAMOSANUM



J. W. NICHOLS, SC.

W. SCHOLL, DEL.

HYMENATHERUM ANOMALUM, n. sp.



PEREZIA MONTANA, n. sp.

Perityle microglossa Benth, var. *effusa* Gray. *Bidens pilosa* Gray, non L. Proc. Amer. Acad. xxi. 432.

This plant differs from *P. microglossa* in several important particulars beside those pointed out in the Syn. Flora. The habit and leaves are different, the rays white instead of yellow, and the inflorescence differs some. Its relationship seems to be with *P. microcephala*, from which it differs in its pubescence, somewhat larger heads, different disk-corolla, etc. Palmer's 238 is a coarser plant, more villose and with fewer heads, but it apparently belongs here. Like the latter is Palmer's 373, from the mountain cañons about Alamos, where it is very common.

Porophyllum macrocephalum DC. Grows under bushes in cañons. It has the very strong odor of Rhue. Alamos. Sept. 16 to 30. No. 716.

Tagetes Lemmoni Gray. Collected but once before and this by Lemmon in southern Arizona. Palmer found but a single plant near water-course in the middle of the mountains of Alamos. It grows about 3 feet high, with a large top. March 26 to April 8. No. 339.

Pectis punctata Jacq. Stems prostrate or ascending. Common on stony ridges. Alamos. Sept. 16 to 30. No. 730.

Pectis prostrata Cav. Common near the water in grassy bottoms near Alamos. Sept. 16 to 30. No. 659.

Hymenatherum anomalum Canby & Rose, n. sp. Slender annual, 6 to 20 inches high, with many slender branches, glabrous or nearly so: leaves opposite or alternate, with 7 to 9 filiform segments bearing large oblong oil glands: involucre campanulate; bracts in 2 series, equal, free, about 2 lines long, acute, broadly lanceolate, bearing 1 to 5 oblong oil glands: rays conspicuous, about 10, spreading, oblong, 5 lines long, 3-toothed: disk-flower tubular, $1\frac{1}{2}$ lines long, with throat longer than the proper tube and 5-toothed: style-branches elongated, obtuse: akenes linear-turbinate, slightly pilose: pappus paleaceous, in 2 series: outer series 10; paleæ spatulate, laciniate-toothed; inner series 10, 3-aristata, the inner longer, hispid.—Abundant near the base of Alamos Mountain. March 26 to April 8. No. 346.

This genus combines the characters of several closely related genera but is nearest *Hymenatherum*, yet it seems to break down its most distinctive character, viz, the connate involucre. It seems to belong clearly to the subtribe Tagetinae as laid down by B. & H. and only differs in having a double involucre. It differs from *Hymenatherum* in having 2 series of bracts and these free, and as defined by B. & H. in having a conical receptacle and in its 3-toothed ray and merely toothed disk-flowers and pappus in 2 series. But as stated by Dr. Gray in a later revision most of these characters break down in certain species. Of the species of this genus, it resembles most *H. Neo-Mexicanum*, resembling it in habit and having a similar receptacle. It has the free involucre bracts of *Adenophyllum* but with different style-tips, and the pappus is very different from *A. coccineum*, the only species left in this genus by Dr. Gray. It has the free bracts and the bristles at the base of the leaves of *Pectis*, but with a different style and receptacle.

EXPLANATION OF PLATE VII.—Plant natural size; a, ray; b, corolla; c, style; d, pappus; all enlarged.

Perezia montana, n. sp. Three to five feet high, slender, purplish, glabrous: leaves coriaceous, reticulated, narrowly oblong, 3 to 6 inches long, 9 to 12 lines broad, with a broad clasping base, spinose-dentate: panicle loose, spreading, glabrous: involucre scales 3 to 5 series, narrowly oblong, acute, sometimes a little obtuse, the lower and smaller ones mucronate, glabrous except the puberulent margin: akenes glabrous, 3 lines long, flattened, delicately ribbed, narrowed at apex.—Very rarely seen: grows under oaks on the higher parts of the Alamos Mountain. March 26 to April 8. No. 285. Belonging to the *P. rigida* group as arranged by Dr. Gray.

EXPLANATION OF PLATE VIII.—Section from the top and bottom of plant, natural size and the base of stem showing tufts of wood, much enlarged; e, akene.

Trixis obvallata H. & A. It grows about 2 feet high: the flowers are yellow, with a strong pine odor. It is commonly called "Yerba del aira," and is used extensively by the common people in preparing a medicine for colds. Alamos. March 26 to April 8. No. 290. The plant differs from the figure in Beechey's Report in having entire leaves, but it seems the same as Pringle's No. 2431, referred here by Mr. Watson. It is certainly very near *T. longifolia*; Parry and Palmer's No. 1121, referred here by Mr. Hemsley, is the same as our plant.

Lobelia laxiflora H. B. K. Only a few plants found in a deep ravine in a portion of the Mountain of Alamos. March 26 to April 8. No. 288.

Heterotoma tenella ¹ Mart. & Gal. This little plant is very variable; our specimens being either simple, 1 to 2 inches high, 1 to few flowered; or taller, 10 to 12 inches high, and often branching. It grows in moist spots half way up the mountain side. Alamos. March 26 to April 8. No. 289. Here belong also Bourgeau's No. 1722, distributed as *Lobelia Cliffortiana*, and also so referred by Hemsley in Biol. Cent.-Amer. ii. 266. The Smithsonian Institute distribute under the same name a plant from Orizaba, collected by Botteri (No. 1191), which is also this species: this plant is tall, with long filiform branches. All of these specimens differ from the original description in being puberulent below.

Metastelma latifolia, n. sp. High climbing shrub, nearly glabrous: leaves oblong to lanceolate, roundish at base, obtuse with abrupt appendiculation, an inch long, shortly pedunculate, margin and midrib pubescent (especially above): umbel short-peduncled, 3 to 7-flowered: pedicels $1\frac{1}{4}$ lines long: flowers very small, less than 1 line long: calyx lobes short, acute: corolla white, the oblong, obtuse lobes densely puberulent on their inner margins: column very short if any: lobes of the crown about equal the stigma.—Climbing over the tops of bushes, it forms a compact mass of sweet-scented flowers. Alamos. September 16 to 30. No. 665. According to the recent Revision of Dr. Gray (Proc. Amer. Acad. xxi.) it comes in the sub-section containing *M. Pringlei*; but the foliage is different.

Buddleia verticillata H. B. K. A large bushy plant, early glabrate, 5 to 8 feet high, with woody stems and rough bark: lower leaves ovate, 10 inches long and serrate; upper leaves lanceolate with cuneate base, entire: heads on peduncles 4 to 8 lines long: flowers yellowish with "honey-like odor." Common on good soil everywhere about Alamos. March 26 to April 8. No. 279.

Erythraea Madrensis Hemsl. Biol. Cent.-Amer. ii. 346. Collected on the top of Alamos Mountain. March 26 to April 8. No. 405. Seemann's plant is the only one referred here, but it seems to me that Parry and Palmer's No. 567 (collected in 1878) should also be referred here.

The variety (No. 2597) in Mr. Pringle's collection is lower and more spreading, and with more twisted anthers.

Gilia Sonoræ Rose. Contr. Nat. Herb. i. 90. This plant is reported as very abundant on the sandy river bottoms. Alamos. March 26 to April 8. No. 396.

Læselia glandulosa Don. Common. Alamos, March 26 to April 8. No. 399.

Cordia (Sebestenoides) Sonoræ, n. sp. A small tree 10 to 20 feet high, 6 inches in diameter; younger parts puberulent: leaves elliptical, 2 to 4 inches long, obtuse, entire, a little scabrous above: racemes short and dense: calyx cylindrical, 5 to 6 lines long: corolla white, 15 lines in diameter: stamens 5 to 7, exserted.—A common tree in low places and on hillsides. About Alamos. September 16 to 30. No. 376.

Called Palo-de-Asta, and is one of the most beautiful of flowering trees; the whole tree is covered with large clusters of white flowers (becoming lavender by age), a short distance away entirely hiding from view the large shining leaves. The tree has a symmetrical top and is well worthy of cultivation.

EXPLANATION OF PLATE IX.—A flowering branch and showing flowers and leaves; natural size.

¹ Another species of this genus has been wrongly distributed, viz, Palmer's No. 43 (1886), from Jalisco, referred to *Lobelia subnuda* Gray, Proc. Amer. Acad. xxii. 433, which is *H. arabidoides* B. & H.

Heliotropium phyllostachyum Torr. Only a few plants found growing on a creek bottom. Alamos. September 16 to 30. No. 637.

Krynitzkia micromeres Gray. This plant is very common on sandy bottoms. Alamos. September 16 to 30. No. 397.

Ipomœa murucoides Rœm. & Schultz, var. **glabrata** Gray. This plant is without leaves (except very young ones), and its appearance is peculiar; as it is now apparently for the first time collected in fruit, we append a description. A tree 20 to 30 feet high, 1 foot or more in diameter, with smooth bark and numerous branches: leaves (immature) about 1 inch long, ovate-lanceolate, strongly reticulate and pubescent below: racemes terminal, many flowered: calyx as well as pedicels and young branches puberulent: sepals oval, obtuse, 5 lines long: corolla about 2 inches long, white, yellowish below: filaments pubescent at base: capsule 10 lines long, 2-celled, 4-valve, 4-seeded: seeds 5 lines in length, oblong, with a long coma upon the sides. The tree is called "Palo santo," and is very abundant about Alamos. No. 316.

The wood is of no commercial value. The Mexicans use the ashes for soap-making. Dr. Palmer says: "But one flower of a raceme opens at a time, and the large tree, devoid of foliage, and with only 3 or 4 large flowers, presents a peculiar appearance". The flowers of our plant are similar to Gray's type (Palmer's No. 703, of 1886), and Pringle's No. 2443 (of 1889), from near the same locality, but the sepals are shorter and obtuse and not glabrate. The sepals resemble Hemsley's figure of the species, which is probably Gray's form. According to dates on the title pages, it appears that H. B. K.'s specific name *macrantha* is older by one year than Rœm. and Schultz, and if the oldest specific name is used, Don's combination should be taken up. *Convolvulus macranthus* H. B. K. Gen. et Spec., iii. 95; *Ipomœa murucoides* Rœm. & Schultz, iv. 248; *Ipomœa macrantha* Don. Gen. Syst. iv. 267.

Ipomœa bracteata Cav. This is a climbing plant and without leaves, but with long racemes of flowers with large purple bracts. It is called "Zicana." It has large tubers, like sweet potatoes, which are eaten raw by the Mexicans. Alamos. March 30 to April 8. No. 313.

Ipomœa Grayi, n. sp. High climbing, glabrous or nearly so: leaves orbicular to broadly ovate, $1\frac{1}{2}$ to 3 inches long, truncate or somewhat cordate at base, on peduncles 2 to 5 inches long: peduncles variable, $1\frac{1}{2}$ to 3 lines long, 1 to several flowered: pedicels $1\frac{1}{2}$ to $2\frac{1}{2}$ inches long, somewhat thickened in fruit: sepals 3 to 4 lines long, broad and obtuse: corolla purple, 3 inches broad: stamens short, included; capsule glabrous, ovate, 7 to 8 lines long, 4-valved, 2-celled, 4-seeded: seeds $3\frac{1}{2}$ lines long, densely puberulent.—Alamos. September 16 to 30. No. 710. Also collected by Dr. Palmer in SW. Chihuahua (1885). No. 102. This is a profuse bloomer and a vigorous plant, climbing over fences, walls, and the highest trees.

*I. rubro-cœrulea*¹ Gray, non Hooker. Proc. Amer. Acad. xxi. 434.

I. violacea Gray in herb. non L. To this latter species should be referred, according to herbarium note of Dr. Gray, *I. rubro-cœrulea* of Hemsley. Biol. Cent.-Amer. ii. 393. *I. Grayi* differs from *I. rubro-cœrulea* in its calyx teeth not being "subulate-linear," the color of the corolla, and somewhat in the shape of the leaves. Its alliances seem to be with *I. pedicellaris* Benth. of Central America, and without seeing the type it is hard to separate the two.

¹After the above was prepared and sent to the printer, a letter was received from Sir Joseph Hooker from which the following note, respecting this plant, is taken: "Mr. Hemsley has told me that your *Ipomœa* is quite distinct from *I. rubro-cœrulea* in the calyx, and also from *I. pedicellaris* which has an open sinus to the leaf."

Ipomoea alata,¹ n. sp. Slender, climbing, glabrous throughout: leaves thin, triangular in outline, 2 to 3 inches long, with broad open sinus, acuminate: peduncles 2 to 4 inches long, somewhat winged, 1 to 3-flowered: pedicels 9 lines long, clavate thickened in fruit and deciduous with it: calyx "brick-red," 9 lines long, closely enveloping the ripe capsule: corolla "scarlet," salver-form: tube 2 inches long; limb 1 inch broad: stamens included or the anthers (2 to 4 lines long) barely protruding: style included: stigma 2-lobed: capsule globular, 6 lines in diameter, 2-celled, 4-seeded: seeds oblong, 3 to 4 lines in length, glabrous, black.—Collected along creek bottoms and in cañons. It climbs over fences and bushes at Alamos. September 16 to 30. No. 706. A peculiar species and seemingly nearest *I. rhodocalyx*. *I. alatipes* has a similar winged peduncle, but the flowers are 3 inches in diameter.

EXPLANATION OF PLATE X.—Natural size of plant shown; a, seed.

Ipomoea Quamoclit L. Very common at Alamos. September 16 to 30. No. 707.

Ipomoea Palmeri Watson. Proc. Amer. Acad. xxiv. 63. "Flowers creamy-white, open at night." Common about Alamos, climbing over trees, bushes, fences, etc. March 26 to April 8. No. 305. This species is only known from Palmer's (No. 75) 1887 collection at Guaymas.

Ipomoea, sp. Only a few plants found, climbing over bushes. The corolla is purple. Alamos. March 26 to April 8. No. 304.

Physalis, sp. A little viscid: flowers small, yellow with brownish eye. It grows in a shady cañon. Alamos. September 16 to 30. No. 709.

Solanum diversifolium Schl. About 6 feet high with loose branches: flowers white. Collected in a shady ravine near the summit of the mountain. Alamos. March 26 to April 8. No. 364.

Solanum Fendleri Van Huck. and Müll. About 3 feet high. Only a single plant found and this in poor condition. At the base of Alamos Mountain, March 25 to April 8. No. 364. This approaches nearest Fendler's No. 254, from Panama, of any specimen seen in Gray or National Herbarium, but the pubescence is redder, stems somewhat thorny, and racemes shorter.

Both these plants are merely tentatively referred as above as better material may place them quite differently.

Solanum (Androcera) Grayi, n. sp. A slender annual, 1 to 2 feet high, stems more or less thorny: leaves pinnately parted with ovate to oblong segments irregularly toothed or cleft: racemes few-flowered: pedicels of the flower very short: of the fruit 6 lines long, somewhat thickened: corolla small, 4 to 6 lines in diameter, white: stamens irregular, 4 short, 1 long and curved: fruit very prickly.—Only a few plants found in shade near Alamos. September 16 to 30. No. 633. Here should be referred *S. sisymbriifolium* Gray, Proc. Amer. Acad. xxi. 434. Although a larger plant than Palmer's present plant, the flowers are much smaller than in *S. sisymbriifolium*.

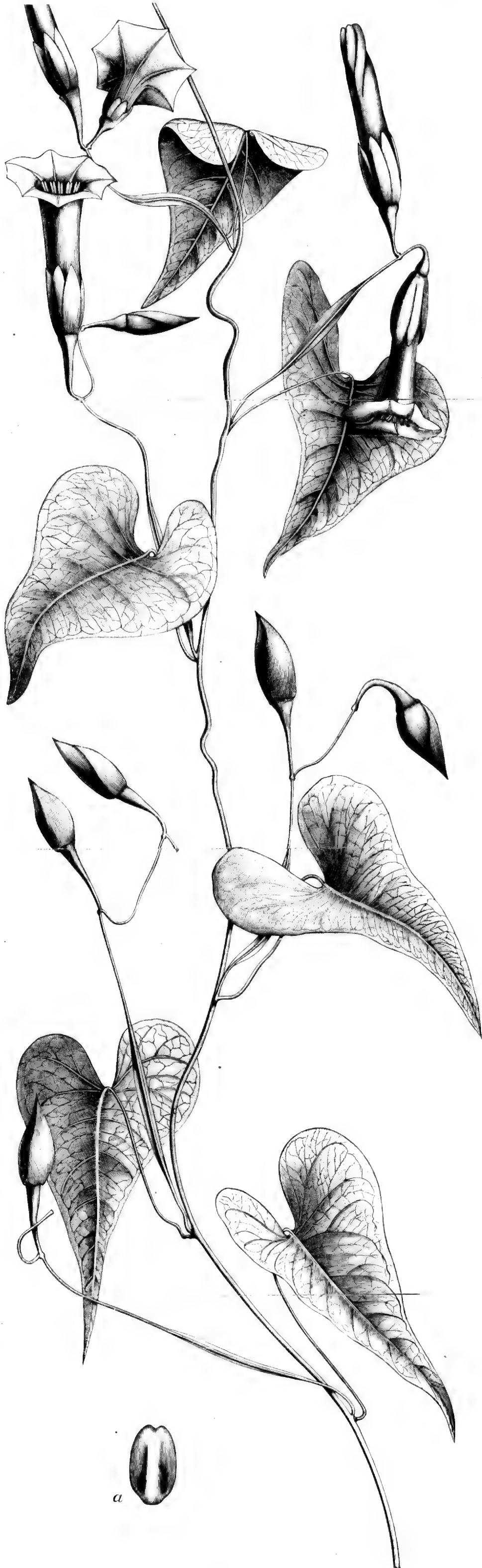
Solanum Amazonium Ker. A loose growing shrub 2 to 3 feet high with showy purple flowers. Here should be referred No. 237 (1885) of Palmer from SW. Chihuahua. It is *S. elaeagnifolium* Gray, not Cav. Proc. Amer. Acad. xxi. 434. It differs conspicuously from *S. elaeagnifolium* in its slender, curved and dissimilar stamens, and in its erect, fruiting pedicels: In the sterile flowers the calyx is naked and three of the anthers much longer (6 lines long); in the fertile and lower flowers the calyx is armed with prickles and the anthers nearly equal, or often longer. Near Alamos. March 26 to April 8. No. 314.

Solanum verbascifolium L. This is a shrub 4 to 5 feet high; its fruit is "orange-colored." Common along river banks among bushes. Alamos. March 26 to April 8. No. 392.

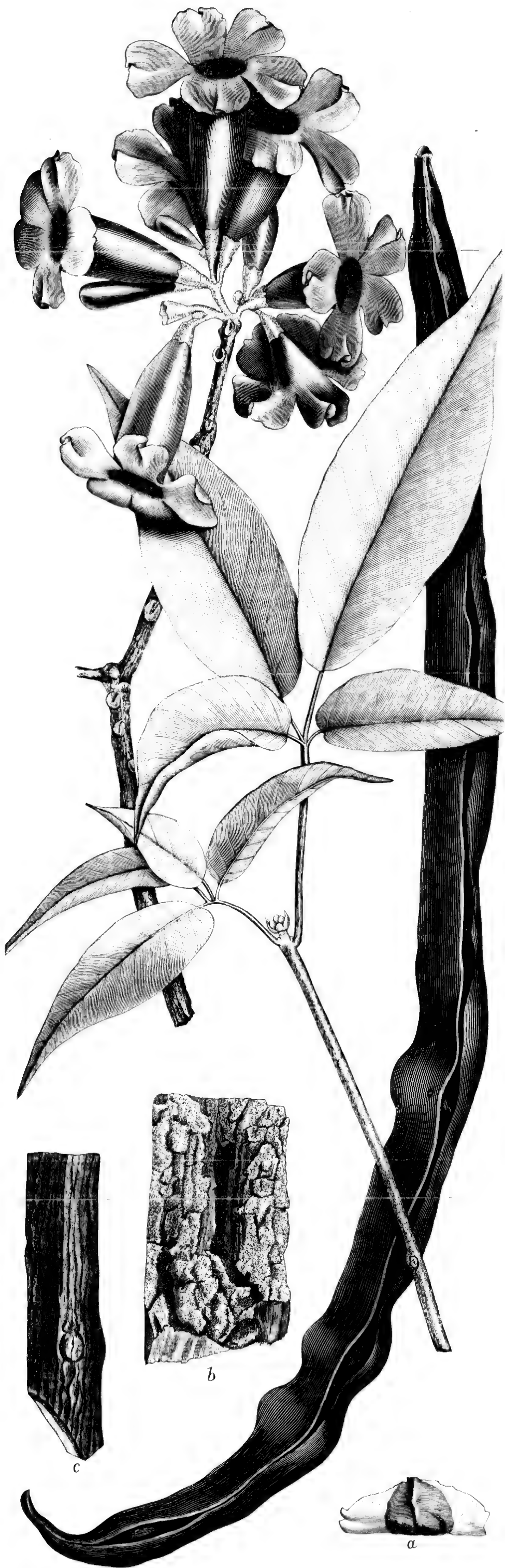
¹ From the above letter of Sir Joseph Hooker is also taken the following note: "Your *I. alata* may also, Mr. Hemsley thinks, be new and belongs to the same group a, *I. alatipes*."



CORDIA PALMERI. n. sp



IPOMOEA ALATA, n. sp.



R. C. SMITH.

TABEBUIA PALMERI, n. sp.

- Nicotiana glauca** Graham. At Alamos it is called "Maraquiana;" at Guaymas, "Don Juan." The leaves are laid upon the head of patients to relieve headache. About Alamos. March 26 to April 8. No. 331.
- Nicotiana trigonophylla** Dunal. Common at Alamos on hillsides and in old fields. March 26 to April 8. No. 308.
- Linaria Canadensis** Dumont. Abundant on the sandy river bottoms. Alamos. March 26 to April 8. No. 395.
- Mimulus floribundus** Dougl. This plant was found abundantly along a water-course, half way up the mountain. It has a strong odor like musk. Although common along the border we have no specimens from Mexico. Alamos. March 26 to April 8. No. 338.
- Mimulus cardinalis** Dougl. The calyx teeth are more slender and acuminate. Only two small plants seen. Found half way up the mountain. Alamos. March 26 to April 8. No. 328.
- Mimulus luteus** L. Common along a water-course near Alamos. March 26 to April 8. No. 276.
- Stemodia Palmeri** Gray. Proc. Amer. Acad. XXI. 403. The corolla is dark purple and the lobes of the lower lip are broad and retuse; the anther cells are unequal in size. Collected on a rocky ridge in the shade near Alamos. March 26 to April 8, No. 327, and September 16 to 30, No. 727.
- Stemodia durantifolia** Swartz. This plant was found along a water-course half-way up the mountain. Alamos. March 26 to April 8. No. 337.
- Conobea intermedia** Gray. Collected on a rocky ridge. Alamos. September 16 to 30. No. 728.
- Aphyllon Californicum** Gray. This plant was found growing under bushes in a low valley. The flowers are purple. Alamos. March 26 to April 8. No. 318.
- Tabebuia Palmeri**, n. sp. A large tree 18 to 25 feet high: leaves opposite; leaflets 4, 2 to 5 inches long, oblong, obtuse at base, somewhat acuminate glabrous or nearly so: flowers in close clusters at the ends of the naked branches: calyx small, 2 to 3 lines long, covered with a mealy pubescence: corolla $1\frac{1}{2}$ to 2 inches long with ample tube, mealy-puberulent, white and purplish with yellow spots: capsules terete, 15 inches long, 8 to 10 lines in diameter, straight or nearly so, smooth and ribless: seeds very numerous in several series, oblong, 12 to 18 lines long by 6 lines broad, winged at the ends.—In ravines near the base of the mountain. Alamos. March 26 to April 8. No. 320. Called "Amapa." A beautiful flowering tree with its large Paulownia-like flowers, which Dr. Palmer describes as light-mauve at base, with white and yellow patches; they quickly fade. Only a few flowers were found at the ends of the naked branches. Two leaves, each with 4 leaflets, were found on the tree and Dr. Palmer says the new ones had not begun to appear; there was an abundance of long black pods. The trunk of the tree is covered with a thick, rough bark, resembling the oak; the wood is hard and durable and is generally used for rafters in the construction of houses in this region. That this is a *Tabebuia*, as considered by Benth. and Hook., there can be very little doubt, although the inflorescence is a little more compact than the known species of this genus. It is a little surprising that such a handsome tree of some economic value has until now remained unknown.
- EXPLANATION OF PLATE XI.—Upper part shows flowers, lower part stem and leaves; natural size; a, seed; b, piece of bark; c, section of stem; d, pod.
- Calophanes bilobatus** Seem. Stem procumbent with branches ascending, glandular, pubescent throughout: leaves 1 to 2 inches long, including the petiole, acute, somewhat tapering at base: flowers in glomerate clusters with small, foliaceous bractlets shorter than the calyx: calyx 6 lines long, cleft to the base (or becoming so) into subulate lobes: corolla lilac, 8 lines long, its tube 5 lines long: style pubescent; stigma linear, hardly oblique: capsule 4 lines long, glabrous. Edge of a ravine at Alamos. March 26 to April 8. No. 402. The plant has a very offensive odor. Bourgeau's specimen also has the pubescent style. Collected recently by Pringle.

- Justicia caudata** Gray. Proc. Amer. Acad. xxi. 405. Flowers "mauve-colored:" capsule (including the short thick stipe) 6 to 7 lines long: seeds orbicular. Only a single plant found, in a shady ravine. Alamos. September 16 to 30. No. 666. This seems to be the same plant which Palmer collected in 1885.
- Dicliptera resupinata** Juss. But a single large plant seen. Alamos. September 16 to 30. No. 632.
- Lantana vetulina** Mart. & Gal. About 3 feet high: flowers white. Common on wooded hills and slopes. Alamos. March 26 to April 8. No. 379.
- Lantana involucrata** L. Alamos. September 16 to 30. No. 635.
- Lantana macropoda** Torr. Very common at Alamos. September 16 to 30. Nos. 636 and 740.
- Bouchea dissecta** Watson. Proc. Amer. Acad. xxiv. 68. The flowers in these specimens are blue. Collected at Agiabampo, October 3 to 15. Letter G.
- Dr. Palmer says he obtained this plant at Alamos also.
- Priva echinata** Juss. Flowers "light purple." Only a single specimen seen, growing in shade in a creek bottom. Alamos. September 16 to 30. No. 745.
- Castilleja tenuifolia** Benth. The bracts and calyx are scarlet. Only a few plants seen near the summit of the mountain. Alamos. March 26 to April 8. No. 366.
- Verbena Aubletia** L. This plant is very common in old fields and valleys about Alamos. March 26 to April 8. No. 307.
- Verbena ciliata** Benth. This plant is used as a pot-herb by the Mexicans, who call it Verbena. March 26 to April 8. No. 326.
- Hyptis suaveolens** Poit. Flowers said to be white. Only one or two nutlets mature. Called by the Mexicans "confitura;" they use it as a tea to abate fevers. Alamos. Sept. 16 to 30. No. 734.
- Hyptis Seemannii** Gray. Proc. Amer. Acad. xxi. 407. Alamos. March 25 to April 8. No. 398.
- Salvia (Calospatha) Alamosana**, n. sp. Two or three feet high, with many lateral branches, more or less pubescent when young: leaves 2 to 3 inches long, on very short petioles, narrowly lanceolate, cordate at base, with very broad rounded crenatures, silky when young, slightly hispid or glabrate in age: calyx 2 lines long; upper lip entire; lower, 2 toothed: corolla blue, about 5 lines long; its upper lip short, erect, pubescent: lower portion of the connective deflexed, connate, and broad.—Grassy slopes half way up the mountain side. Alamos. March 30 to April 8. No. 345. This plant does not seem to agree with any of our Mexican *Salvias*.
- Salvia privoides** Benth. This plant is common in the shade along water-courses and cañons. Alamos. Sept. 16 to 30. Nos. 680, 681.
- Salvia hyptoides** Mart. & Gal. Flowers pale blue. Found in shade of bushes in a mountain cañon. Alamos. Sept. 16 to 30. No. 682.
- Salvia elegans** Vahl. This plant grows about 2½ feet high. It is a common plant throughout Mexico; only two plants were seen; these were found in the upper part of the mountain in a shaded ravine. Alamos. March 26 to April 8. No. 292.
- Stachys coccinea** Jacq. This plant has showy "salmon-colored" flowers. The filaments are nearly equal and villous as in *Physostegia*, although Dr. Gray says in Syn. Flora (p. 347) "filaments naked." Only a few plants were seen. Found in a shady ravine near the summit of the mountain. Alamos. March 26 to April 8. No. 365.
- Teucrium Cubense** L. Common in gardens and fields. Alamos. March 26 to April 8. No. 277.
- Boerhaavia Alamosana**, n. sp. Stems 12 to 15 inches high, branching throughout, glabrous or below somewhat scabrous-pubescent; leafy below; leaves linear to narrowly lanceolate, 1 to 2 inches long (including the petiole), whitish below: racemes slender, spike-like; bracts and bractlets purplish ovate-lanceolate, caducous: perianth white, drying yellowish, 2 lines broad: stamens (4) and

style exserted; fruit 1 line long, clavate, obtuse with obtuse ribs.—Hillside about Alamos. Sept. 16 to 30. No. 714. In fruit and habit resembling *B. Palmeri*, but with larger flowers, more and longer stamens, etc. It resembles Palmer's specimen of *B. Wrightii* from Guaymas, in habit and pubescence, but has smaller fruit and differs in number of stamens and larger flowers, etc.

Boerhaavia Sonora, n. sp. Stems somewhat spreading, much branched above; flowers in head-like cluster, "crimson": involucre $\frac{1}{2}$ line long: stamen 1, rarely 2 (?): style exserted, capitate; fruit clavate with tapering tip.—Along water-courses near Alamos. Sept. 16 to 30. No. 715. Seemingly the same species as No. 172 of Palmer's 1887 collection from Guaymas.

Boldoa lanceolata Lag. A small shrub 2 to 3 feet high, with several stems. Flowers "cream color." Very common at Alamos and also Agiabampo on hillside, in cañons and valleys. Collected in fruit at Alamos. March 26 to April 8, and in fruit and flower September 16 to 30; at Agiabampo, October 3 to 15. Nos. 310, 720.

According to Mr. Hemsley there is some uncertainty whether this plant should be called *Salpianthus arenarius* H. & B. or as above, and we give here as far as we know its bibliography:

B. lanceolata. Lag. Nov. Gen. et Sp. 10. Roem & Schult. Syst. i. 522. Bot. Sulph. p. 155. DC. xiii. 2, 438. Biol. Cent.-Amer. iii. 8.

S. arenarius H. & B. Pl. Æquin. 1. 154 t. 44. H. B. K. Nov. Gen. et Sp. ii. 218. Poir. Illus. Suppl., 536 t. 906.

Telanthra stellata Watson. Proc. Amer. Acad. xxi, 436. The typical form found at Alamos, Sept. 16 to 30. No. 760, with this and more common was found Var. *glabrata*, n. var., a form with narrower leaves and white instead of straw-colored glomerules, but in other respects apparently the same. No. 760a.

Dr. Palmer says he saw it at Agiabampo also.

Aristolochia brevipes Benth. Very common in bottom lands. Much used as a medicine. Near Alamos. March 26 to April 8. No. 329.

Iresine celosioides L. A climbing plant with large spreading panicles of flowers. Collected along ravines and river banks near Alamos. March 26 to April 8. No. 389.

Euphorbia (Poinsetia) tuberosa, n. sp. Seemingly a new species. Slender, delicate plant about 1 foot high: leaves (lower) alternate, scattering, linear, 3 to 4 inches long, a line broad: upper leaves verticillate, a little broadened at base and acuminate, bright crimson: flowers terminal, 1 to few; involucre 4-lobed; lobes small, entire or 3-toothed: glands 4, large, cup-shaped: bracts purple, fimbriate: styles bifid.—In ravines in the upper portions of the mountains. March 25 to April 8. No. 356.

Commonly called "Contrayerba." A small tuberous-rooted plant. It is a medicinal plant of much repute and is used in kidney and liver troubles.

Euphorbia florida Engl. Collected on gravelly bottoms near Alamos. Sept. 16 to 30. No. 640.

Euphorbia plicata Watson. Proc. Amer. Acad. xxi. 438. Stems 2 to 3 feet high. The leaves fall as soon as they begin to dry. Rocky hills about Alamos. Sept. 16 to 30. No. 631.

Euphorbia florida Engl. On grassy bottoms around Alamos. No. 356.

Jatropha angustidens Muell. Seeds 4 lines long, gray, spotted with brown. Alamos. Sept. 16 to 30. No. 639.

Croton (Eucroton) Alamosanum, n. sp. A small shrub 4 to 6 feet high, younger parts villose-pubescent: leaves oblong-lanceolate, 3 to 5 inches long, 1 to 2 inches broad, almost sessile, densely stellate-pubescent, a little glandular at base; stipules orbicular, slightly dentate-glandular: racemes dense, at first spike-like, becoming more or less elongated, sometimes 4 inches long; female flower more common at the base, but sometimes throughout the racemes; calyx deeply 5-parted; petal none;

¹ Roem & Schult., says *flores rubi*.

styles 3, thrice dichotomous; seeds 3, 2 lines long: male flowers more numerous; calyx 5-parted, petals 5, white, glabrous without, villose within; stamens 12 to 13 with glabrous filaments.—On sandy ridges and along creek bottoms under shrubs near Alamos. March 26 to April 8. No. 324. Found in flower and fruit Sept. 16 to 30. No. 742. Belongs to the subsections *Cyclostigma*, perhaps near *C. heterocalyx*.

Acalypha polystachya Jacq. The larger leaves 4 to 5 inches long on petioles 5 to 6 inches long; the long filiform lobes of the involucre, ciliate with glandular-tipped hairs. Grows along water-courses near Alamos. Sept. 16 to 20. No. 724. This is *A. filifera* Watson, which seems to be only a form of the above species.

Acalypha subviscida Watson. Proc. Amer. Acad. xxi. 440. Leaves with shorter petioles than in the type; fertile spikes, sometimes staminate for half the length above; style-branches, long, purplish; staminate spikes, occasionally 2 or 3 from a common peduncle, generally with an abortive pistillate flower at tip. Collected in a cañon near Alamos, Sept. 16 to 30. No. 641.

Sebastiania Palmeri, n. sp. A loose-growing shrub 5 to 8 feet high, or sometimes a small tree 10 feet high, 5 inches in diameter, glabrous, diœcious: leaves lanceolate, to narrowly lanceolate, $2\frac{1}{2}$ to 4 inches long, including petiole 6 lines long, slightly dentate: female flowers solitary, sessile; calyx 3-parted, its lobes oval, serrate; petals none; styles 3, connate at base, entire; ovary 3-celled; valves contorted after dehiscence; seeds 1 in each cell, globose, 2 lines in diameter without a strophiole.—Seen in various places about Alamos. March 26 to April 8. No. 403; also in September. Letter A. The natives speak of it as “Palo de la flecha que de los semas brinca doras”—“the arrow-wood which produces the jumping beans.” The generic position of the plant in which *Carpocapsa* is found has long puzzled the botanist and entomologist. This is partly due to the fact that the fruit which is stung (and this is the kind that is generally collected) appears very different from those developed naturally. While this is evidently a new species, still some uncertainty exists as to its position. Its relationship is doubtless with *Sebastiania*, but it has close affinities with both *Gymnanthus* and *Bonania*; in habit it seems closer to the latter than to either the other two, however its minute or obsolete calyx seems to be sufficient to keep it out of that genus. It has the rudimentary calyx and connate stamens of *Gymnanthus*, but has dehiscent and contorted carpels which are thin walled; carpophore wanting; leaves serrate: all of which is at variance with this genus, but corresponds with *Bonania*. Dr. Palmer says the boys gather these beans, for which they find a ready market at Alamos. None of the beans which had been stung were obtained, as they had all been carefully gathered before Dr. Palmer's visit and none of the so-called “jumpers” could be obtained at Alamos at this time. The plant produces an abundance of milk, which is said to be used by the Indians for poisoning their arrows. The milk readily crystallizes into a clear, rather brittle substance, and is a violent cathartic. The wood is very hard.

Ficus, sp. A large tree with many wide-spreading branches, 2 feet in diameter, with thick, corky bark: leaves alternate, oblong-lanceolate, acute at both ends, 4 to 6 inches long, on a petiole 9 to 16 lines long: fruit nearly globose, 10 lines in diameter on a very short pedicel (2 lines long). Near Alamos. March 26 to April 8. No. 367. The fruit is very abundant and edible and is called “Chalala.” Dr. Palmer collected the same species at Hacienda San Miguel in southwest Chihuahua in 1885.

Tillandsia recurvata L. This plant was found growing on oaks. Alamos. March 26 to April 8. No. 372.

Heteranthera limosa Vahl. Alamos. September 16 to 30. No. 731.

Commelina Virginica L. Alamos. September 16 to 30. No. 663.

Tradescantia Palmeri, n. sp. Stems erect, 6 to 9 inches high, glabrous, or with a pubescent line: leaves lanceolate, 1 to 2½ inches long, glabrous except the ciliate margin (and sheath), sessile, acute: umbels pedunculate (1 to 2 inches long), 4 to 9-flowered: pedicels 3 to 5 lines long: sepals oval, 1½ lines long: petals white, 1½ lines long: stamens 6; filaments naked, the 3 longer with dilated filaments; the 3 shorter almost sessile: style short: cells 3, each with 2 ovules: seeds 3, triangular, 3-lobed, the margins revolute.—Found in moist shady places among rocks near Alamos. September 16 to 30. No. 737.

It differs from most species of *Tradescantia* in its one-seeded cells; the ovules however are two, the lower being abortive. The filaments differ considerably in length, but the anthers are but slightly different. It is perhaps nearest the *T. amplexicaulis* and yet I am not certain this is the proper section. It resembles *T. Disgrega* very much in habit.

Mr. Watson has suggested a relationship with *T. geniculata* from which species it differs in having the lower surface of the leaves glabrous (at least not villous): unequal stamens, with glabrous filaments: seeds of different shape, glabrous and alveolate.

Leptorhæo tenuifolia, n. sp. Slender annual, erect or a little spreading and rooting at the joints, glabrous or pubescent in lines: leaves linear, 1 to 1½ inches long, 1 to 2 lines broad, glabrous except a little pubescence at base: peduncles from the axils of the leaves, mostly in clusters of 3 or 4, 9 to 12 lines long: flowers in umbellets of 2 to 4, sometimes solitary, glabrous: sepals 1 line long: petals, 1 line long, blue: stamens 6, of two lengths: capsule 3-celled, 3-seeded.—It grows in shade along water-courses at Alamos. Sept. 16 to 30. No. 744.

This makes the second species for this genus and confirms the wisdom of separating it from *Tradescantia*, to which it is closely related and with which the type species had for nearly forty years been associated. It differs from *Tradescantia* chiefly in having but 1 ovule in each cell, and in the shape of the seeds and the central position of the hilum. It seems to be closely related to *L. filiformis* of Southern Mexico, but appears quite distinct, differing especially in its more erect habit, narrower and longer leaves, glabrous pedicels and calyx, and in the inflorescence.

Quercus, sp. Only sterile branches found: leaves glabrous, narrowly lanceolate, 2 to 3 inches long, with spiny-toothed margin. Alamos. March 26 to April 8. No. 368.

Quercus grisea Liebm. Alamos. March 26 to April 8. Nos. 369–370. “Nos. 369 and 370 probably belong to the same species, No. 369 being a vigorous shoot.” C. S. Sargent.

Quercus Kelloggii (?) Newberry. “Probably a narrow leaved form of this species; certainly there is no other described species to which it can be referred.” C. S. Sargent. Alamos. March 26 to April 8. No. 371.

The above oaks were found on the summit of the Alamos mountains and have neither flower nor fruit. They are mostly stunted forms 15 to 20 feet high and 1 to 1½ feet in diameter.

Eleocharis¹ *capitata* R. Br. The stems are about 3 inches high, and peculiar in being recurved. Alamos. March 26 to April 8. No. 411.

Eleocharis¹ *palustris* R. and S. var. *glaucescens* Gray. The achenia in these specimens are triangular, but in all other respects the characters are those of this form; and triangular achenia sometimes occur in *E. palustris*.

Fimbristylis diphylla² Vahl. Found in a moist place near a creek. Alamos. September 16 to 30. No. 699.

Cyperus incompletus² Link. Grows sparsely in wet places near Alamos. September 16 to 30. No. 701.

¹ Determined by F. C. Coville.

² Determined by N. L. Britton.

- Cyperus Schomburghkianus**¹ Nees. Found in a shady damp spot under bushes. Alamos. September 16 to 30. No. 703.
- Cyperus**.¹ Too young. No. 747.
- Paspalum**² **setaceum** Michx., var. **pubiflorum** Vasey, n. var. Spikelets somewhat glandular-pubescent. Grew in a swampy place, many plants together. Alamos. September 16 to 30. No. 704.
- Eriochloa aristata** Vasey. Bull. Torr. Bot. Club. xiii. 229. Found in a cultivated field, used for fodder, mixed with other grasses. Alamos. September 16 to 30. No. 692.
- Panicum capillare** L. var. ? Alamos. September 16 to 30. No. 690.
- Panicum fasciculatum** Swartz. Alamos. September 16 to 30. No. 694.
- Panicum Hallii** Vasey. Bull. Torr. Bot. Club. xi. 61. Found in a ravine near Alamos. September 16 to 30. No. 695. Also at Agiabampo in low wet places. September. No. 750.
- Panicum sanguinale** L. Cultivated field near Alamos. September 16 to 30. No. 685.
- Setaria pauciseta** Vasey. Bull. Torr. Bot. Club. xiii. 230. The seed of these grasses had shelled out. The tops were very full. The seeds and stems had become a golden color. The natives pull these grasses from cultivated fields and sell them at stables at Alamos, near which they grow. September 16 to 30. Nos. 684 and 686.
- Cathastechum erectum** Vasey & Hackel. Grows in thick lawn-like patches often completely hiding the ground; on hillsides and level places near Alamos. September 16 to 30. No. 705.
- Manisuris granularis** Swartz. Found at one locality only; on a hillside near Alamos. September 16 to 30. No. 700.
- Sorghum halepense** Linn. Cultivated field near Alamos. September 16 to 30. No. 687.
- Aristida scabra** Kunth. Near the summit of the mountain. Alamos. March 26 to April 8. No. 410; also, in small bunches, many together, among underbrush on hillsides. September 16 to 30. No. 702.
- Mühlenbergia Alamosæ** Vasey. Bot. Gaz. xvi. 146. Perennial, culms closely tufted, 2 to 2½ feet high, slender, wiry, many (6 to 9) jointed, leafy, mostly unbranched: lower leaves approximate, erect, the upper distant, often overtopping the panicle, bud-like protrusions at the lower nodes: panicle capillary, spreading, 3 to 4 inches long, pyramidal, branches erect-spreading, 1 to 2 inches long, flowering nearly to the base: pedicels short to 2 or 3 times as long as the spikelets: spikelets purple, 1½ lines long, empty glumes half as long, ovate, acuminate or awn-pointed, 1-nerved: flowering glume lance-linear, 3-nerved, 1½ lines long, 2-toothed and with an awn 3 to 4 times as long: palea equaling its glume, bifid at apex; both palea and glume hairy at the base. Found in a shady arroyo in the mountain. Alamos. March 26 to April 8. No. 407. This is the type.
- Mühlenbergia distichophylla** Kunth. Collected near the summit of the mountain. Alamos. March 26 to April 8. No. 409.
- Mühlenbergia dumosa** Scrib. Common along water-courses in the mountain. Alamos. March 26 to April 8. No. 406.
- Mühlenbergia ramosissima** Vasey. Bull. Torr. Bot. Club. xiii. 231. In fields near Alamos. September 16 to 30. No. 691.
- Mühlenbergia virescens** Trin. Near the summit of the mountain. Alamos. March 26 to April 8. No. 408.
- Sporobolus confusus** Vasey. Grows in thick patches along water-courses. Alamos. September 16 to 30. No. 696. This is *Sporobolus ramulosus* of American authors, not of Kth. It is *Vilfa confusa* Fourn.

¹ Determined by Dr. N. L. Britton.

² Grammae determined by Dr. Geo. Vasey.

- Epicampes cœrulea** (?) Often 5 feet high. It grows in wet lands near the mouth of Yacque River; it is brought in bundles to Guaymas, where it is used to thatch out-buildings and the dwellings of the poor. March 26 to April 8. No. 414.
- Bouteloua aristidoides** Thurb. Very common on bottoms and level places among hills. Alamos. September 16 to 30. No. 697.
- Bouteloua Alamosana** Vasey, n. sp. Apparently annual, culms tufted, mostly decumbent or prostrate, 3 to 6 inches high: leaves narrow, 1 to 1½ inches long: panicle racemose, 1 to 1½ inches long, with 3 to 5 spikes, each composed of 3 to 4 crowded spikelets, about ¼ inch in length: spikelets 2-flowered: empty glumes linear, 2 to 3 lines long, the upper scabrous on the keel: glume of fertile flower oblong-lanceolate, 3½ lines long, 3-toothed and 3-awned, its palet as long, bifid at apex: glumes of sterile flowers with the body about two lines long, 2 lateral lobes reaching nearly to the base, 4 lines long, the central one 5 lines long.—Many plants growing together on rocky ridges. Alamos. September 10 to 30. No. 698.
- Bouteloua polystachya** Torr. In gravelly soil with underbrush. Alamos. September 16 to 30. Nos. 751, 791.
- Bouteloua polystachya** Torr. Var. ? Nos. 751, 791.
- Leptochloa mucronata** Kunth. In garden with other grasses near Alamos. September 16 to 30. No. 699. No. 749 grew in low wet places near tide lands at Agiabampo.
- Diplachne viscida** Scrib. Found at the base of the hill in a moist place. Alamos. September 16 to 30. No. 748. No. 748½, same plant, collected in a swamp at Agiabampo.
- Eragrostis ciliaris** Link. ? No. 688; and
- Eragrostis major** Host. Found in cultivated field; used in stables at Alamos. September 16 to 30. No. 689.
- Pinus occarpa** Schiede. A small tree, 25 feet high, 1 foot in diameter, with pendent leaves, 8 to 9 inches long: cones about 2½ inches long; apophysis 4 to 5-sided with a somewhat elevated umbo which is especially strong toward the base: seeds 6 to 7 lines long. Collected near the summit of Alamos Mountain. March 26 to April 8. No. 374.
- The seeds of this species are described as being an inch long, and the trees are said to be 40 feet high. As is generally known, Dr. Engelmann found in his study of the leaves of pines that the resin ducts might occupy one of three positions in the parenchyma, viz, internal, parenchymatous, or peripheral. In this species the ducts are peculiar and can not be assigned to any of the group. On each side of the leaf are two ducts which with the surrounding strengthening cells completely separate the parenchyma tissue into distinct regions; the ducts extend from the fibro-vascular bundle to the epidermis or its underlying strengthening cells. These ducts have the paradoxical position of being both peripheral and internal. Dr. Engelmann in his arrangement places this species in the section with internal ducts, but says he occasionally found parenchymatous ones. We have not seen his specimens, but Palmer's plant of 1886 referred here by Mr. Watson has similar ducts. Dr. Palmer says there were many young plants which would be especially fine for cultivation.
- Notholæna candida** Hook.¹ Found under shade of rocks half-way up the mountain. Alamos. March 26 to April 8. No. 341.
- Notholæna Lemmonii** D. C. Eaton.¹ From mountain cañons. Alamos. September 16 to 30. No. 669.
- Selaginella cuspidata** Link.¹ Under shade. Alamos. September 16 to 30. No. 672.
- Notholæna sinuata**¹ Kaulf. Grew in shade near Alamos. September 16 to 30. No. 671.

¹ These plants were determined by Henry E. Seaton.

Adiantum emarginatum¹ Hook.

Adiantum thalictroides¹ Willd. Found near water-course at Alamos. March 26 to April 8. No. 344.

Cheilanthes microphylla¹ Swartz. Under shade of rock. Alamos. September 16 to 30. No. 672.

Indeterminable sp. "Papachi boraacho" is an upright growing shrub 8 to 10 feet high with short branches and very thorny: leaves very small 3 to 4 lines long obovate: fruit very numerous, globose, about 10 lines in diameter, indehiscent: seeds numerous, black, flattened. Not found in flower, and the fruit was nearly destroyed by birds. Alamos. March 26 to April 8. No. 330.

¹These plants were determined by Mr. Henry E. Seaton.

LIST OF PLANTS COLLECTED BY DR. E. PALMER IN ARIZONA IN 1890.

By J. N. ROSE.

Dr. Palmer, after having made large and valuable collections in Lower California and Mexico in the early months of the year, visited Arizona during the latter part of April, remaining there through May and June and a part of July. He made collections at Camp Huachuca, Willow Springs, and Fort Apache. A small collection made in 1889 at Camp Huachuca which Dr. Palmer purchased is included in this report; these plants are designated by letters only.

Camp Huachuca is about 15 miles from the Mexican border at the base of the Huachuca Mountains, in the extreme southeastern part of Arizona. Its elevation is 5,100 feet above sea level. The mountains are rough and rocky. The soil is of decomposed granite. Dr. Palmer was here from April 26 to May 21, and collected about one hundred species. The season was unfavorable for his work as no rain had fallen for seven months and the mountains and valleys were dry and barren, and the only plants found in proper condition for collecting were in the gardens and in two moist cañons. The plants of this collection are numbered from 416 to 478; unfortunately the numbers 450 to 459 were repeated, hence the latter are designated by the letter *a* in addition.

The only other important collection¹ made at this place is that of Mr. J. G. Lemmon and wife in 1882, a very large and valuable one, of which over fifty species were new.

Willow Springs is in the White Mountains near the pass leading to Fort Apache, at an altitude² of 7,600 feet. It is 75 miles south of Holbrook on the Atlantic and Pacific Railroad and is reached only by stage. The mountains here are covered with oaks and pines, and the two large meadows from which this collection was largely made, kept damp by the springs, were covered with vegetation. Dr. Palmer remained here from June 10 to 25; the nights at this season are very cool, often thin ice is

¹ Mr. Lemmon writes me that Dr. Palmer visited this place once before; as it was during the dry season nothing of importance was obtained.

² Dr. Rothrock gives the altitude of the pass 7,400 feet and of Willow Springs 7,195. Wheeler's Report, vi. 22.

formed. At this time he collected the plants numbered 479 to 574; on his return from Fort Apache he remained two days, July 5 and 6, collecting numbers 613 to 626.

Dr. Rothrock, in Wheeler's Report, vol. vi., has forty eight species from this place; most of these were recollected.

Fort Apache, upon the east fork of Salt River, in the Indian reservation of the valley of the White Mountains, has an altitude of 5,200 feet.¹ It is only reached after one hundred miles of rough mountain staging. The mountain here also is covered with oaks and pines, but the valley is dry, having little or no vegetation. Salt River supplies water for the fort and for irrigating the gardens and the farms of the Indians. The temperature is 10° warmer than at Willow Springs. Dr. Palmer was at Fort Apache from June 21 to 30, collecting plants numbered 575 to 613.

Dr. J. J. Rothrock made a small collection here in 1874. (Wheeler's Report, vi.)

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- Clematis Palmeri**, n. sp. A peculiar form which we have not been able to place. It seems nearest *C. filifera* Benth. of Mexico. The leaves very thin and delicately nerved, pinnate-ternate; the leaflets obtusely 3-lobed, paler beneath: peduncles one-flowered, 6 to 7 inches long: akenes with long plumose tails.—Among bushes along river bottom. Fort Apache, June 21 to 30. No. 600.
- Thalictrum Fendleri** Engelm. Under bushes in a ravine near Willow Springs. June 10 to 20. No. 516.
- Ranunculus affinis** R. Br., var. *cardiophyllus* Gray, Proc. Phil. Acad. 1863, p. 56. Common in swampy meadows. Collected here by Rothrock also. This form was first published by Dr. Gray, under the above varietal name, followed by Rothrock, Watson, and others, but in his last revision he takes up a new name, var. *validus*. Willow Springs, June 10 to 20. No. 498.
- Ranunculus macranthus** Scheele. Very common in wet bottoms. Rothrock also collected it here. Willow Springs. June 10 to 20. No. 495.
- Ranunculus hydrocharoides** Gray. Common, in a marsh. This species was also collected here by Rothrock. Willow Springs. June 10 to 20. No. 485.
- Aquilegia chrysantha** Gray. Very common in the cañons along water courses. Fort Huachuca. April and May. No. 434.
- Erysimum Wheeleri** Rothrock. Only in flower, but apparently this species. Willow Springs. June 10 to 20. No. 483.
- Capsella Bursa-pastoris** Moench. Collected in a garden at Fort Huachuca. April and May. No. 444.
- Ionidium polygalæfolium** Vent. Collected in an old garden at the mouth of a cañon. Fort Huachuca. April and May. No. 445.
- Cerastium nutans** Raf. In swamps at Willow Springs. June 10 to 20. No. 515.
- Claytonia Chamissonis** Esch. Willow Springs. June 10 to 20. No. 570.
- Sphaeralcea Fendleri** Gray. A peculiar form with very small flowers and carpels. Grows on open mesas at Fort Apache. June 21 to 30. No. 594.
- Linum perenne** L. Willow Springs. June 10 to 20. No. 529.
- Linum aristatum** Engelm. *vide* Trelease. Collected at the edge of rich bottoms and slopes under oaks and pines. Willow Springs. June 10 to 20. No. 497.
- Ptelea trifoliata** L. A loose growing shrub about 8 feet high. Fort Huachuca. April and May. No. 428.
- Rhamnus Californica** Esch., *vide* Trelease. Fort Huachuca. April 26 to May 21. No. 431. Willow Springs. June 10 to 20. No. 520.

¹ Only 5,000 feet. Wheeler's Report, vi. 23.

- Ceanothus integerrimus** Hook. and Arn. Fort Huachuca. April and May. No. 427. "The leaves are somewhat thicker, more like *C. spinosus*," Mrs. K. Brandegee. Found at the head of a deep cañon among undershrubs. April and May. No. 427.
- Ceanothus Fendleri** Gray, *vide* Mrs. K. Brandegee. Very common. Willow Springs. June 10 to 20. No. 501.
- Ceanothus buxifolius** Willd., *vide* Mrs. K. Brandegee. Fort Huachuca. April and May. No. 451.
- Vitis Arizonica** Engelm. A very common grape and bears abundant fruit: when growing in shade of trees and bushes it climbs over them, but when growing in exposed places alone it becomes bush-like with merely the slightest inclination to climb, and has the appearance of a California cultivated grape which has been closely pruned to the height of 3 to 4 feet. Fort Apache. June 21 to 30. No. 609. Also very common in all the cañons at Huachuca. April 20 to May 21. No. 446.
- Rhus glabra** L. Only a few plants seen at Fort Apache. June 21 to 30. No. 585.
- Rhus Toxicodendron** L. Very common. Fort Huachuca. April to May. No. 453a.
- Rhus aromatica** Ait., var. *trilobata* Gray. Called "Squaw berry," and is gathered in great quantities by the Indians. The slender twigs are used by them in making baskets. Fort Apache. June 21 to 30. No. 590.
- Thermopsis montana** Nutt. Willow Springs. June 10 to 20. No. 528.
- Lupinus Palmeri** Watson. Very common under pines and on high level places. Willow Springs. June 10 to 20. No. 533.
- Trifolium involucreatum** Willd. Common in marshes along creeks. Also collected here by Rothrock (No. 229). Willow Springs. June 10 to 20. No. 507.
- Hosackia Wrightii** Gray. Willow Springs. June 10 to 20. No. 525.
- Hosackia puberula** Benth. Collected at the edge of a garden at Fort Huachuca. April and May. No. 422.
- Psoralea tenuiflora** Pursh. Willow Springs. June 10 to 20. No. 512. Also collected near Fort Huachuca in 1889.
- Amorpha fruticosa** L. A shrub 4 to 6 feet high, with many stems. "Bloom navy-blue with amber-colored anthers." Common along creeks. Also collected here by Rothrock (No. 244). Willow Springs. June 10 to 20. No. 484.
- Dalea formosa** Torr. A small bush, 1 to 1½ feet high. Fort Apache. June 21 to 30. No. 584.
- Dalea aurea** Nutt. Grows on stony mesas among bushes. Fort Apache. June 21 to 30. No. 611.
- Petalostemon candidus** Michx. Grows in large masses along river bottoms. Collected by Rothrock (No. 248) at Willow Springs. Fort Apache. June 21 to 30. No. 595.
- Astragalus Bigelovii** Gray. Collected near Fort Huachuca, 1889. Letter M.
- Astragalus Arizonicus** Gray. Collected on the parade ground at Fort Huachuca. April and May. No. 424.
- Vicia leucophæa** Greene. Bot. Gaz. vi. 217. About 2 feet high, hanging over small plants. Leaflets 2 to 6, mostly 4. Flowers "lemon-colored with violet spot." Style densely hairy in the middle. Very near to this species is *V. medicincta* Watson, and should be referred as var. *medicincta* of the above species. It differs only in its more narrow leaflets and stipules.
- In the type (Palmer's specimen) the stipules are described as linear, the flowers solitary on pedicels (peduncles), 3 to 6 lines long. In the only other collection of this form (Pringle's, 1887) I find some of the stipules almost subhastate, and some of the peduncles an inch or more long, with 2 flowers. I should state here that I have not yet seen any specimens of this form with 6 leaflets.
- A slight change is necessary in Mr. Greene's description of the style, which he

says is "very villous at the apex," while Lemmon's plant, seemingly a part of the type, has the style hairy as above. The species has only been reported from southwestern New Mexico and southeastern Arizona, while this variety is from New Mexico. Palmer's specimens were collected at Willow Springs July 5 and 6. No. 625.

Vicia pulchella H. B. K. Flowers white. Also collected here by Rothrock under various numbers. Willow Springs. July 5 and 6. No. 621.

Vicia Americana Muhl. Collected here also by Rothrock (No. 224 in part). Willow Springs. June 10 to 20. No. 530.

Lathyrus paluster L., var. *angustifolius* Gray. Grows sparsely on rich bottoms under pines. "Bloom white, upper part pink." Also collected by Rothrock (No. 224). Willow Springs. June 10 to 20. No. 534.

Robinia Neo-Mexicana Gray. A thorny bush or tree 8 to 12 feet high: a loose grower; "bloom rose color," drying purplish. Collected here by Lemmon in 1882. Very common in cañons about Fort Huachuca. April and May. No. 440.

Desmanthus Jamesii T. & G. Bloom lemon color with yellow anthers. Common on gravelly bottoms. Fort Apache. June 21 to 30. No. 606.

Desmanthus depressus H. & B. Flowers "at first canary color, by age becoming salmon color." No fruit obtained. Very common in rich bottoms. Fort Apache. June 21 to 30. No. 613.

Mimosa biuncifera Benth. A loose thorny bush 1 to 1½ feet high: "flowers white," but in Rothrock's report said to be purplish. Also collected by Lemmon at this station. Very common on the plain at the foot of the mountain at Fort Huachuca. April and May. No. 449.

Prunus salicifolia H. B. K., var. *acutifolia* Watson. Proc. Amer. Acad. xxii. 411. Ten to fifteen feet in height, 5 inches in diameter, with edible fruit. Fort Huachuca, April and May. No. 450a.

Fragaria vesca L. Grows among bushes on sloping rich bottoms at Willow Springs. June 10 to 20. No. 487.

Geum triflorum Pursh. Willow Springs. June 10 to 20. No. 506.

Potentilla Hippiana Lehm. Very common in rich moist bottoms. Willow Springs. June 10 to 20. No. 482.

Rosa Fendleri Crepin. This species was also collected at this station by Rothrock. What seems to be the same species from Fort Huachuca was collected from a garden, but the plant originally grew in a neighboring cañon. No. 435. Willow Springs. June 10 to 20. No. 505.

Amelanchier alnifolia Nutt. About 4 feet high. It was found in ravines, high up the mountains. Willow Springs. June 10 to 20. No. 504.

Heuchera rubescens Torr. Collected near Fort Huachuca 1889. Letter K.

Oenothera albicaulis Nutt. Collected at the outer edge of a garden near Fort Huachuca. April and May. No. 471.

Oenothera serrulata Nutt. Willow Springs. June 10 to 20. No. 481.

Oenothera Hartwegi Benth. Common on rich bottoms. Fort Apache. June 21 to 30. No. 582.

Oenothera triloba Nutt. "Flowers yellow." Grows in marshy meadows. This same form was collected at this station by Rothrock. Willow Springs. June 10 to 20. No. 568.

Gaura suffulta Engelm. Found in level places exposed and in the shade. Flowers white but soon change. Willow Springs. June 10 to 20. No. 508.

Gaura coccinea Nutt. Flowers at first white, then rose and sometimes crimson. Fort Huachuca. April and May. No. 417.

Gaura sp. Seemingly near *G. Nealleyi* Coulter. The lower part of stem and leaves glabrous (except a few stiff hairs), above puberulent. Not in fruit and but a single plant seen. Flowers white, changes to red. On hillside. Fort Huachuca. April. No. 420.

- Cereus caespitosus** Engelm. The flowers are a bright red. Common on stony ridges and mountain sides. Fort Huachuca. April and May. No. 475.
- Cereus** sp. Not very common. A very free bloomer with bright showy scarlet flowers. Fort Huachuca. April and May. No. 429.
- Cereus pectinatus** Engelm. (?) A single fruiting specimen obtained. Fort Huachuca. April and May. No. 447.
- Opuntia Engelmanni** Salm. Flowers yellow. Fort Huachuca. April and May. No. 477.
- Opuntia hystricina** Engelm. and Bigel. "It grows about a foot high with several joints." Flowers yellow, lower third red. On stony ridges. Fort Huachuca. April and May. No. 474.
- Opuntia arborescens** Engelm. This cactus is 2 to 3 feet high with flowers of a beautiful crimson. On stony plains and hillsides at Fort Huachuca. April and May. No. 476.
- Pseudocymopterus montanus** var. *tenuifolia* Coult. & Rose. Rev. p. 75. (*Thaspium* (?) *montanum* var. *tenuifolium* Gray.) Common at Willow Springs. June 10 to 20. No. 500. Also collected here by Rothrock.
- Cornus stolonifera** Michx. *vide* Coulter & Evans. A shrub 4 feet high. Willow Springs. June 10 to 20. No. 518.
- Lonicera ciliosa** Poir. About 2 feet high with drooping habit. Found in ravines high up the mountain side. Willow Springs. June 10 to 20. No. 537.
- Sambucus glauca** Nutt. Also collected by Rothrock. Willow Springs. June 10 to 20. No. 292.
- Symphoricarpos oreophilus** Gray. Willow Springs. June 10 to 20. No. 521.
- Galium trifidum** L. Grows along creeks. Willow Springs. June 10 to 20. No. 514.
- Houstonia Wrightii** Gray. Grows in low places and on hillsides. "Flower white with pink tip and corolla." Willow Springs. June 10 to 20. No. 528.
- Bouvardia triphylla** Salisb. The corolla very slender. Collected near Fort Huachuca in 1889. Letter G.
- Valeriana sylvatica** Banks. Willow Springs. June 10 to 20. No. 526.
- Valeriana edulis** Nutt. A common plant. Willow Springs. July 5 and 6. No. 618.
- Stevia Plummeræ** Gray. Collected in a cañon near Fort Huachuca, Arizona. 1889. Letter A.
- To the stations given in Syn. Flora we here add the following, viz: Mogollon Mountains, New Mexico, Rusby (1881), No. 1524; Mexico, Pringle (1887), No. 1260.
- Stevia serrata** Cav. Collected in a cañon near Fort Huachuca, 1889. Letter B.
- Eupatorium occidentale** Hook., var. **Arizonicum** Gray. A single specimen from near Fort Huachuca, Arizona. 1889. Letter D.
- Carpophæte Bigelovii** Gray. A single specimen from a cañon near Fort Huachuca, Arizona. 1889. Letter C. Pringle is the only collector who got the plant from Arizona, according to Syn. Flora. We have specimens from Rusby, 1881, collected at the San Francisco Mountains.
- Aplopappus spinulosus** DC. Collected in a cañon near Fort Huachuca, Arizona. 1889. Letter F.
- Solidago Missouriensis** Nutt. Var. Not very common, along river bottoms. Fort Apache. June 21. No. 602.
- Aster ericæfolius** Rothrock. Common on mesas and hillsides at Fort Huachuca. April 26 to May 21.
- Erigeron divergens** T. & G. The stems lie close to the ground. Upper end of a cañon under bushes. Near Fort Huachuca, Arizona. April 26 to May 21. Nos. 450, 494.
- Erigeron flagellaris** Gray. Willow Springs. June 10 to 20. No. 503.
- Baccharis Wrightii** Gray. Grown on second bottoms of Salt River. June 21 to 30. No. 580.

- Baccharis pteronioides** DC. Small shrub 3 feet high on stony mesas. Fort Huachuca, Arizona. April 26 to May 21. The female plant is No. 468. The male plant is a compact shrub 2 to 3 feet high on rocky sides of cañons. No. 443.
- Zinnia grandiflora** Nutt. Fort Apache. June 21 to 30. No. 583.
- Rudbeckia laciniata** L. Willow Springs. July 5 and 6. No. 620.
- Lepachys columnaris** T. & G. Fort Apache. June 21 to 30. No. 601.
- Wyethia Arizona** Gray. The large roots yield a peculiar odor. Grows in rich bottoms under pines; rather common. Willow Springs. June 10 to 20. No. 543.
- Vigiera cordifolia** Gray. Grows in shade along river bottoms at Fort Apache. June 21 to 30. No. 593.
- Thelesperma gracile** Gray. Very common. Fort Apache. June 21 to 30. No. 396.
- Hymenopappus filifolius** Hook. Grows on rich bottoms. Fort Apache. June 21 to 30. No. 599.
- Hymenopappus Mexicanus** Gray. Found on sandy river bottoms. Willow Springs. June 10 to 20. No. 517.
- Hymenopappus radiata**, n. sp. Perennial from a long slender root, $1\frac{1}{2}$ feet high, branching at base floccose-tomentose becoming somewhat glabrate above: leaves mostly radical, 1 to 2 pinnate into narrow linear segments: heads corymbose on peduncles 1 to 2 inches long: involucre bracts broad, little or not at all petaloid: rays about 5, white, 6 to 7 lines long: disk-flowers numerous; proper tube short, about $\frac{1}{2}$ line long; throat swollen, campanulate, about 1 line long; lobes short, acute, about one-third the length of throat; anthers but not the filaments exserted: akenes $1\frac{1}{2}$ to 2 lines long, obpyramidal, 4-angled with a delicate intermediate nerve, glabrous or a little puberulent: pappus of numerous very short paleae.—Common in low rich bottoms under pines and oaks. Willow Springs. July 5 and 6. No. 615.
- This species differs from all other species of *Hymenopappus* in the presence of ray-flowers, but in other respects corresponds with this genus. Its habit is perhaps more like *H. filifolius*, but the akenes and pappus are more like *H. flavescens*. Although it seems undoubtedly a *Hymenopappus*, yet in all its external appearances, including the rays, it resembles *Leucampyx*; the disk-flowers, akenes, and pappus are also similar. It has been a puzzle to me to separate this species clearly from *L. Neuberryi*, and it is questionable whether they ought not to go together and be placed under *Hymenopappus*. The following are the slight differences I note between the two: In *H. radiata* the pappus is not so deciduous, the proper corolla tube is shorter, and the style-branches a little thicker and not so papillose. The absence of the bracts on the receptacle seems to be the only reliable character separating the two genera.
- Actinella Bigelovii** Gray. This species has been collected in Arizona by quite a number of collectors, but is only credited to New Mexico in Syn. Flora. Grows on stony ridge and slope under pines. Willow Springs. June 10 to 20. No. 486.
- Gaillardia pinnatifida** Torr. The entire-leaved form; a free bloomer. Collected in a garden, in good soil by a water ditch. Fort Huachuca, Arizona. April 26 to May 21. No. 430.
- Pectis longipes** Gray. Common on mesas and hillsides near Fort Huachuca, Arizona. April 26 to May 21. No. 425.
- Achillea Millefolium** L. Willow Springs. June 10 to 20. No. 524.
- Senecio Actinella** Greene. According to Syn. Flora only collected by Rusby at Flag Staff, but it was obtained at the original station by J. G. Lemmon and wife in 1884, and now collected and reported by Dr. Palmer as very common at Willow Springs. June 10 to 20. No. 488.
- Senecio aureus** L. form. Fort Huachuca, April 26. No. 438.
- Senecio Neo-Mexicana** *vide* S. Watson. Willow Springs. June 10 to 20. No. 480.
- Senecio lugens** Richards. A very common plant under pines at Willow Springs. June 10 to 20. No. 479.

- Senecio Douglasii** DC. Very common. Fort Huachuca, Arizona. April 26 to May 21.
- Cacalia decomposita** Gray. In a cañon near Fort Huachuca. 1889. Letter E. The plant is in Pringle's 1886 collection, from Chihuahua, Mexico.
- Cnicus ochrocentrus** Gray. The roots are boiled and eaten by the Apache Indians. A common plant on bottoms and hillsides. Fort Apache. June 21 to 30. No. 605.
- Rafinesquia Neo-Mexicana** Gray. The flowers are pinkish-white when first open. Collected from the parade ground at Fort Huachuca, Arizona. April 26 to May 21. No. 456.
- Krigia amplexicaulis** Nutt. Common in wet bottoms along creeks. Willow Springs. June 10 to 20. No. 539.
- Hieracium Fendleri** Schultze Bip. var. **discolor** Gray. Common on bottoms and mountain slopes. Willow Springs. June 10 to 20. No. 532.
- Malacothrix Fendleri** Gray. Collected on the parade ground at Huachuca, April 26. No. 421.
- Troximon aurantiacum** Hook. var. **purpureum** Gray. The flowers are yellow becoming purplish in drying. The specimens correspond exactly with Fendler's original specimens. Collected in rich bottoms at Willow Springs. June 10 to 20. No. 541.
- Pyrrhopappus multicaulis** DC. Grows in low sandy places near river banks. Willow Springs. June 10 to 20. No. 519.
- Lactuca graminifolia** Michx. Willow Springs. June 10 to 20. No. 510.
- Anisacanthus Thurberi** Gray. An upright growing bush about 5 feet high. Beside the collection mentioned in Syn. Flora, we have the species from Pringle, Parish, and Smart. Fort Huachuca, Arizona. April and May. No. 453.
- Arctostaphylos pungens** H. B. K. Fort Huachuca. April and May. No. 458^a (?).
- Arbutus Xalepensis** H. B. K. var. **Arizona** Gray. A large shrub or small tree 10 to 15 feet high, largest stem 6 inches in diameter. Fort Huachuca. April and May. No. 433.
- Samolus Valerandi** L. var. **Americanus** Gray. Grows in boggy soil near Fort Huachuca. May. No. 470.
- Dodecatheon**, sp. Leaves oblanceolate, 2 to 3 inches long: scape about a foot high, 4 to 5-flowered: flowers 4-parted: "corolla light crimson with purple tinge, the base of petals with white spot and a yellow ring below all:" stamens, 3 lines long, distinct, sessile: capsule obtusish, about the length of calyx. Grows in swamps. Willow Springs. June 10 to 20. No. 342.
- According to Dr. Gray's Revision in Botanical Gazette this form would go into his second section which contains only *D. frigidum*, as the stamens are distinct and almost sessile, but it can hardly be his variety *dentatum* as the leaves are of a different shape, entire, and flowers purple. It resembles in habit the Rocky Mountain variety *alpina* which has been variously referred. But it is not the variety *alpina* recently described by Mr. Greene, Pitt. ii. 12, as *D. pauciflora* as this has a staminal tube nearly as long as the anthers. In the recent arrangement of Mrs. Brandegee, Zoe i. 20, this would answer best in her variety *Jeffreyi*, but as it is here defined, I do not think it includes all the forms placed under it by Dr. Gray. It most resembles a specimen of Cusick's collected in 1884 and distributed as *D. Media*.
- Forestiera Neo-Mexicana** Gray. A stiff growing shrub 4 to 5 feet high in cañons at Fort Apache. June 21 to 30. Nos. 578 and 612.
- Fraxinus pistaciæfolia** Torr. A small tree 6 to 10 feet high. In cañons at Fort Apache. June 20 to 30. No. 592.
- Frasera speciosa** Dougl. This plant grows 4 to 5 feet high. Willow Springs. June 10 to 20. No. 573.

- Gilia aurea** Nutt. Willow Springs. June 10 to 20. No. 496.
- Krynitzkia Jamesii** Gray. Fort Apache. June 21 to 30. No. 591.
- Lithospermum multiflorum** Torr. Common under trees. Willow Springs. June 20 to 30. No. 536.
- Lithospermum Cobrense** Greene. Collected near a ditch in a garden, at Fort Huachuca. April and May. No. 432.
- Onosmodium Thurberi** Gray. Willow Springs. July 5 and 6. No. 617.
- Mertensia paniculata** Don. Willow Springs. July 5 and 6. No. 619.
- Apocynum cannabinum** L. Willow Springs. June 10 to 20. No. 511.
- Asclepias tuberosa** L. In cañons about Fort Huachuca. May. No. 473. Also very common at Willow Springs. June 10 to 20. No. 538.
- Asclepias speciosa** Torr. This species grows along ravines and rich bottoms. Willow Springs. June 10 to 20. No. 544.
- Asclepiodora decumbens** Gray. On mesas and hill slopes about Fort Huachuca. April and May. No. 437.
- Asclepias involucrata** Engelm. On gravelly mesas. Fort Huachuca. April 26 to May 21. No. 454.
- Acerates auriculata** Engelm. This plant grows on river banks in shade of bushes. "Flowers old-gold." Fort Apache. June 21 to 30. No. 604.
- Solanum umbelliferum** Eschs. Along stony ridges. Fort Apache. June 21 to 30. No. 607.
- Nicotiana attenuata** Torr. "Flowers light-violet with white tinge at summit." Dr. Palmer says, "this is the tobacco once commonly smoked by the Apache Indians but is now only used by the very old men, the younger generation preferring that which is sold in the stores." Fort Apache. June 21 to 30. No. 610.
- Evolvulus lætus** Gray. Gravelly mesas and hillsides. Fort Huachuca. April and May. No. 442.
- Veronica Americana** Schwein. Willow Springs. June 10 to 20. No. 540.
- Castilleja parviflora** Bong. Willow Springs. June 10 to 20. No. 513.
- Veronica peregrina** L. Flowers white. Very common. Willow Springs. June 10 to 20. No. 489.
- Pedicularis Parryi** Gray. This plant differs somewhat from the Colorado forms; the floral bracts are callous-denticulate, the beak shorter and thicker. The flowers are lemon-colored. Very common in grassy swamps at Willow Springs. July 5 and 6. No. 622.
- Mimulus luteus** L. Willow Springs. June 10 to 20. No. 527.
- Mimulus**, sp. Perhaps a form of *M. cardinalis*, but with slender calyx tube with ovate-acuminate lobes; corolla salmon-red, 2 inches long, very slender. Common in cañons. Fort Huachuca. April and May. No. 441.
- Chilopsis saligna** Don. Dwarf trees resembling willows in habit; grow in stony ravines, coming from the mountains. Fort Huachuca. April and May. No. 448.
- Erythraea Douglasii** Gray. Near Fort Huachuca. 1889. Letter 1.
- Calophanes decumbens** Gray. Collected on the parade ground at Fort Huachuca. April 26 to May 21. No. 472.
- Jatropha macrorrhiza** Benth. Plant. Hart. p. 8. A small plant growing on stony mesas and ridges. It has a large root 8 to 9 inches long and 4 to 5 inches in diameter. Fort Huachuca. April and May. No. 469.
- Pentstemon barbatus** Nutt. var. **Torreyi** Gray. "Corolla scarlet, inside of tube orange." A very showy and abundant plant under trees and bushes. Fort Apache. June 21 to 30. No. 588.
- Pentstemon spectabilis** Thurber. "Corolla showy, magenta color. Fort Apache. June 21 to 30.
- Pentstemon linarioides** Gray. Only a few plants seen. Fort Apache. June 21 to 30. No. 585.

- Pentstemon virgatus**¹ Gray. "Corolla white with yellowish cast and a patch of purple on the upper part." Not common; in sandy places. Willow Springs. June 10 to 20. No. 493.
- Pentstemon Wrightii** Hook. ? "Corolla beneath light-snuff color, the remainder violet." Grew on level places under pines and oaks. Willow Springs. July 5 and 6. No. 614.
- Verbena ciliata** Benth. Collected near Fort Huachuca, 1889.
- Dracocephalum parviflorum** Nutt. Grows in rich moist bottoms. Willow Springs. June 10 to 20. No. 569.
- Monarda fistulosa** L., var. **media** Gray. Fort Apache. June 21 to 30. No. 579.
- Monarda fistulosa** L. Grows in profusion on grassy slopes and open level places. Willow Springs. July 5 and 6. No. 626.
- Amarantus retroflexus** L. Called "red-root." The White Mountain Apaches use the plant very much as food; the green herbage is cooked and the seeds gathered, parched and ground into flour, from which they make bread, mush, etc. Fort Apache. June 21 to 30. No. 587.
- Chenopodium album** L. Common. Used by the White Mountain Indians as a pot-herb. Fort Apache. June 21 to 30. No. 587.
- Polygonum Bistorta** L., var. **oblongifolium** Meisn. *vide*, S. Coulter. Willow Springs. June 10 to 20. No. 522.
- Eriogonum alatum** Torr. With more corymbose inflorescence than the type. Common on hillsides and river bottoms. Fort Apache. June 21 to 30. No. 597.
- Comandra pallida** A. DC. Willow Springs. June 10 to 20. No. 502.
- Euphorbia montana** Engelm. A very common plant along cañons. Fort Huachuca. April and May. No. 455.
- Acalypha Lindheimeri** Muell. Collected in an old garden. Fort Huachuca. April and May. No. 419.
- Argythamnia mercurialina** Muell. This plant is very common on dry and exposed places. Fort Apache. June 21 to 30. No. 581.
- Tragia urticæfolia** Michx. Willow Springs. June 10 to 20. No. 491.
- Guilleminea densa** Moq. Common in cañons. Fort Huachuca. April and May. No. 457.
- Gomphrena cæspitosa** Torr. Fort Huachuca. April and May. No. 423.
- Juglans rupestris** Engelm. Seen only in cañons. The young trees are quite ornamental. They grow here to a height of 30 feet, and are $1\frac{1}{2}$ to $2\frac{1}{2}$ feet in diameter. No. 416.
- Alnus incana** Willd., var. A large brushy topped tree 20 to 30 feet high and 12 to 18 inches in diameter. The Indians use the bark in tanning. Fort Apache. June 20 to 30. No. 602.
- Quercus Emoryi** Torr. The acorns of this oak are gathered in great quantities by the Mexicans and Indians. A small tree 30 feet high and $1\frac{1}{2}$ feet in diameter. Fort Huachuca. April 26 to May 21. No. 459a.
- Salix nigra** Marsh., var. **venulosa** Anders, *vide* M. S. Bebb. "This varietal name is retained for forms which the species assumes in its distribution from Texas westward. Notwithstanding the inaccuracies of Anderson's description, these originated quite naturally from certain peculiarities in Wright's No. 1877, which peculiarities are now recognized as having resulted from an abnormal growth." M. S. Bebb.
- Iris Missouriensis** Nutt. Very common at Willow Springs. June 10 to 20. No. 499.
- Sisyrinchium anceps** L. Willow Springs. June 10 to 20. No. 490.
- Sisyrinchium angustifolium** Mill. Same habitat as the last. No. 490 a.
- Allium Nuttallii** Watson. Flowers white. The bulbs are eaten by the Indians and "settlers." Willow Springs. June 10 to 20. No. 574.

¹The specimens have on them an *Æcidium*, which Mr. J. W. Anderson tells me is a new species *Æ. Palmeri*.

- Lilium Parryi** Watson. A free bloomer with sweet-scented canary-colored flowers. Grows in the cañons about Fort Huachuca. Pringle also got it near this station in 1884, and beside the type we have specimens from California collected by Parish. April and May. No. 478.
- Smilacina**¹ **amplexicaulis** Nutt. Willow Springs. June 10 to 20. No. 572.
- Lemna trisulca** L. Common in creeks at Willow Springs. June 10 to 20. No. 531.
- Juncus**² **xiphioides** Meyer, var. **montanus** Engelm. The specimens have only unopened flowers, but they undoubtedly belong here. No. 571.
- Juncus tenuis** Willd. Flowers not yet opened. This is the typical form with flowers not secund and with the lowest involucre leaf much exceeding the panicle. No. 550.
- Juncus Balticus** Dethard, var. **montanus** Engelm. Flowers just beginning to open. No. 555.
- Juncus longistylis** Torr. Flowers just beginning to open. No. 556.
- Juncus longistylis** Torr. Fruit not yet mature. No. 624.
- Juncus tenuis** Willd. No. 461f.
- Juncus xiphioides** Meyer, var. **montanus** Engelm. No. 467a.
- Eleocharis palustris** R. & S., var. **glaucescens** Gray. The specimens are without fruit, but appear to be a 3-styled form of this plant. No. 554.
- Eleocharis palustris** R. & S. The achenes are not yet mature, and the spikes in their young state are less sharply acute than is usual. No. 155.
- Eleocharis montana** R. & S. Plant only in flower and the determination made only on its general resemblance to the species. No. 459.
- Scirpus pungens** Vahl. No. 460.
- Carex**³ **hystericina** Muhl., var. **angustior** Bailey, n. var. Whole plant whitish-green, tall and slender but erect; spikes one-half narrower than in the species, erect or ascending; perigynium less inflated, ascending.—Willow Springs, Arizona. No. 464. Pringle's 222 from Santa Rita Mountains is the same.
- Carex teretiuscula** Gooden. No. 553.
- Carex marcida** Boott. No. 552t. No. 552b is a single immature specimen. Mixed with this is *Carex filiformis* L., var. *latifolia* Boeckl.
- Carex filiformis** L. var. *latifolia* Boeckl. No. 549.
- Carex echinata** Murr. No. 548.
- Carex Nebraskensis** Dew., var. **prævia** Bailey. No. 547.
- Carex nudata** W. Boott. No. 546.
- Carex aurea** Nutt., var. **celsa** Bailey. Perigynia distinctly beaked. No. 545.
- Carex occidentalis** Bailey. No. 467.
- Carex teretiuscula**, Gooden., var. **ampla** Bailey. No. 462.
- Carex hystericina**, form. No. 464.
- Eatonia obtusata** Gray. Var. **robusta** Vasey. No. 466.
- Eatonia Pennsylvanica** Gray, var. **longiflora** Vasey. No. 467.
- Eatonia**⁴ **Pennsylvanica** Gray, var. **major** Gray. 517.
- Eatonia Pennsylvanica** var. Fort Apache June 10 to 20. No. 577.
- Aristida purpurea** Nutt. Fort Apache June 21 to 30. No. 575.
- Stipa leucotricha** Trin. Fort Apache June 21 to 30. No. 576.
- Calamagrostis neglecta** Kunth. A common grass in wet soil. Willow Springs. July 5, 6. No. 616.
- Koeleria cristata** Pers. No. 562.
- Koeleria cristata** Pers, var. Willow Springs. No. 564.

¹ It is proper to state here that Mr. E. L. Greene, in a recent paper (Bull. Torr. Club, xv. 285 to 287), has replaced this genus by the older name *Uniflorum*, which makes this species *U. amplexicaule* Greene.

² The Juncaceæ and Cyperaceæ (except *Carex*) were determined by Mr. F. V. Coville.

³ The *CARICES* were determined by Prof. L. H. Bailey.

⁴ The Gramineæ were determined by Dr. Geo. Vasey.

- Deschampsia caespitosa** Beauv. Willow Springs. Nos. 566 and 559.
Hierochloa borealis R. and S. Willow Springs. No. 558.
Glyceria nervata Trin. Willow Springs. No. 557.
Muhlenbergia virescens Trin. Willow Springs. No. 565.
Agropyrum glaucum R. and S. Willow Springs. No. 563.
Poa pratensis L. Willow Springs. No. 560.
Poa annua L. Huachuca. No. 458.
Festuca myurus L. No. 465.
Festuca Arizonica. Grows on mountain-slopes and rich level places. Willow Springs, July 5 and 6. No. 623.
Panicum scoparium Lam. Willow Springs. No. 561.
Cheilanthes¹ **Eatonii** Baker. Fort Huachuca. April 20 to May 21. No. 437a.
Cheilanthes tomentosa Link. Fort Huachuca. April 26 to May 21. No. 451.
Cheilanthes Lindheimeri Hook. Fort Huachuca. April 26 to May 21. No. 452.
Asplenium Filix-foemina Bernh. Fort Huachuca. 1889. Letter W.
Notholaena ferruginea Hook. Fort Huachuca. 1889. Letter X.
Cystopteris fragilis Bernh. Fort Huachuca. 1889. Letter Y.
Woodwardia radicans Smith.
Equisetum laevigatum A. Br. Fort Huachuca. April and May. No. 463.

MUSCI.

- Marchantia polymorpha** L. Willow Springs. No. 535.
Funaria hygrometrica Sibth. "The spores are somewhat larger than usual in this species."—C. R. Barnes. No. —

FUNGI.

- Agaricus** L., sp. Mr. F. W. Anderson identifies the poor specimens as *A. campestris* probably. The following is Dr. Palmer's note: "This species of mushroom is plentiful during the rainy season. When cooked it is very firm and of better flavor than the ordinary mushroom. The Indians eat it with much relish." Fort Apache. June 21 to 30. No. 508.
Acidium Palmeri Anderson. Journ. Mycol. vi. 122. This is the type of a new species found on *Pentstemon virgatus*, at Willow Spring.

¹Ferns determined by Mr. H. Seaton.

LIST OF PLANTS COLLECTED BY DR. EDWARD PALMER IN 1890 ON CARMEN ISLAND.¹

By J. N. ROSE.

This island is situated in the lower part of the Gulf of California, two-thirds of the way down the Lower California coast, almost in sight of land. It is 120 miles south of Guaymas. It is made up mostly of low mountains, or hills, which in the north are only about 200 feet high, but in the south rise from 800 to 1,000 feet, and are cut by many deep cañons. The surface is rocky, with very poor or no soil. No trees are found here; a few shrubs, sometimes 15 feet high, give the prominent floral features to the island. On the west side is a great salt bed covering about 640 acres to a depth of 12 feet, estimated to contain about 13,000,000 tons of a very fine quality of salt. This island is owned and controlled by a gentleman at La Paz, and a large quantity of the salt is shipped both to Guaymas and San Francisco, and, when the salt is ground, sells as the very best quality for table use. The source² of this vast salt deposit is said to come from the surrounding hills and mountains. All the creeks and cañons open into this lake and, from experiments made, their waters are found to be charged with chloride of sodium. After the rains have ceased, in about fifteen days, the water evaporates and the work of excavation can go on. The only botanist or collector, so far as I know, who has visited this island is Dr. Edward Palmer. He has made two visits and has very thoroughly collected the plants of the island. His first visit was January 1 and 2, 1870. I have not been able to learn the number of species collected, yet it was not large. No report was published on the plants, although most of them were then new species. One or more of them have been identified from time to time as belonging to new species and published as part of the type. Most of the others have been collected elsewhere by Mr. Brandegee or by Dr. Palmer himself, and published as new, without having seen the Carmen Island forms. Dr. Palmer made a second visit last November and remained a week (No-

¹ Read before Section F, of the A. A. A. S. August 22, 1891.

² In Bulletin No. 84 of the U. S. Hydrographic Office (p. 28) it is stated, however, that although the lake is separated from the ocean by a strip of beach a quarter of a mile wide, over which the sea never flows, yet the water rises and falls with the tide. [September 20, 1892.]

venber 1-7, 1890). He visited all parts of the island and brought back a small but interesting collection. The flora is almost identical with that of the peninsula. Of this collection 49 species are known to be common to the peninsula and island; others will doubtless be found; 29 species are also common to Mexico, and 25 to the United States; of the latter, 9 are grasses; 19 of the species were collected by Dr. Palmer at La Paz in 1890; 7 species are, so far as known, local, 5 of which are here for the first time described. The island was so thoroughly explored that probably very few species will be added to the list, and a few details will not be out of place. The number of genera represented on the island is 60, and of species, 68. Of the species 21 are Polypetalæ, 24 Gamopetalæ, 10 Apetalæ, and 13 Monocotyledons. Of these, more than one-half (37) belong to 4 families, viz: Leguminosæ 7; Compositæ 12; Euphorbiaceæ 6; and Graminæ 12; one family belongs to each of the four groups mentioned above; and over one-third (24) belong to two families, viz: Compositæ and Graminæ. Orchidaceæ and Filices, the third and fourth largest families of Mexico, are not represented on the island.

	Polypetalæ.	Leguminosæ.	Gamopetalæ.	Compositæ.	Apetalæ.	Euphorbiaceæ.	Endogens.	Graminæ.	Total.
Number of species	21	7	24	12	10	6	13	12	68
Number of genera	21	7	21	10	8	4	10	9	60
Indigenous species	3	2	2	0	2	0	0	0	7
New species	3	2	1	0	2	2	0	0	5
Common to Mexico									29
Common to Lower California									49
Common to United States									25
Collected by Palmer at La Paz									19

Drymaria diffusa Rose, n. sp. Stems slender, much branched from a perennial base, somewhat glandular-pubescent throughout: leaves thin, broadly ovate to deltoid, 2 to 4 inches long (on petioles somewhat longer), truncate at base, acute or slightly acuminate at apex: inflorescence few-flowered cymes: pedicels filiform, 5 to 8 lines long: sepals equal, 1 to 1½ lines long, thin, oblong, acutish, delicately 1-nerved, scarious margin: petals twice as long as the sepals, 2-parted to the middle into oblong or spatulate segments: stamens 5, unequal, shorter than the petals: capsule globose, 1½ lines long, short stipitate, about 10-ovuled, 3-seeded.—Grows on the shady side of a cañon in roundish bunches. No. 819.

This is *D. glandulosa* Watson, Proc. Amer. Acad. xvii. 328, in part. Our plant differs from this species in its leaves not being so broad, and in having long petals: lower stipules wanting or deciduous, not lacerate: sepals smaller and not so strongly nerved.

Collected by Palmer in 1870 (No. 4) and distributed as *D. ramossissima*.

EXPLANATION OF PLATE XII.—The plant is shown natural size: *a*, capsule showing seeds and style; *b*, a petal; *c*, a stamen; *d*, a sepal; all somewhat enlarged.

Abutilon Dugesii Watson. Only a few plants seen in a cañon, and in poor condition. No. 840. Nearest the above species, but not very satisfactorily placed there.

Hibiscus denudatus Benth. A very poor specimen obtained, badly infested by an insect (*Erisicocenus* sp.). Also obtained in 1870 (No. 15). No. 826.



DRYMARIA DIFFUSA n. sp.



DESMANTHUS FRUTICOSUS n. sp.

Gossypium Harknessii Brandg. Proc. Cal. Acad. ser. 2. ii. 136. A large bush 4 to 6 feet high: leaves very dark green: flowers lemon-color. In cañons, not common. No. 838.

Collected by Mr. T. S. Brandegee on Santa Margarita Island, and by Dr. Palmer from this island in 1870 (No. 3): the latter distributed as *G. Barbadosense*.

Melochia tomentosa L. In cañons, few plants seen. No. 823.

Pagonia Californica Benth. About the mouth of a cañon. Collected in 1870 (No. 13). No. 830.

Bursera microphylla Gray. Commonly called "Torote." Common in the cañons and on mountain sides. No. 884.

Cardiospermum Palmeri Vasey and Rose. Proc. Nat. Mus. ix. 147. Climbs over bushes in cañons. No. 851.

Dalea Parryi Gray. Not very common. No. 824.

Tephrosia Palmeri Watson. Proc. Amer. Acad. xxiv. 46. In cañons. No. 847.

Æschynomene nivea Brandg. Proc. Cal. Acad. ser. 2. ii. 150. Only a few plants seen among rocks in a cañon. No. 818.

Phaseolus filiformis Benth. Few specimens found. Obtained in 1870 (No. 5.). No. 876.

Cassia Covesii Gray. Grows in cañons. No. 843.

Desmanthus fruticosus Rose, n. sp. Shrub 5 to 6 feet high or small tree 10 to 12 feet, glabrous with reddish branches: leaves large: rhachis $1\frac{1}{2}$ to 3 inches long; stipules spinescent; pinnæ 3 to 4 pairs, 1 to 3 inches long with a concave gland between the lowest pair and often one or more of the upper pairs; leaflets 12 to 20 pairs, oblong, 3 to 5 lines long, $1\frac{1}{2}$ to 2 lines broad, with somewhat eccentric midrib: flowers numerous: calyx 2 lines long: petals slender, one line longer than calyx: stamens 10: pods $2\frac{1}{2}$ to $3\frac{1}{2}$ inches long, 3 lines wide, many seeded: seeds flattened, 2 lines in diameter, the semicircular mark on the side very small.—In bottom of cañons. No. 820.

This is *D. virgatus* Benth. Bot. Sulph. p. 14, and Brandg. Proc. Cal. Acad. ser. 2. ii. 152. Also referred to as above in Proc. Cal. Acad. ser. 2. iii. 152.

This species differs from *D. virgatus* in its shrubby habit, lower leaves, larger and more numerous pods, etc. The marking on the side of the seed referred to by Mr. Brandegee in his notes of this species seems to be a generic character, and as it also varies in shape and size in different species it may be of some use in identification. In *D. virgatus*, although the seed is not half as large as in the above species, the marking is much larger.

EXPLANATION OF PLATE XIII.—A fruiting branch is shown natural size; a, flower with calyx split and petals shown; b, a flower; c, a seed; d, the same much enlarged.

Lysiloma candida Brandg. Proc. Cal. Acad. ser. 2. ii. 153. A large bush, sometimes a small tree. One of the most conspicuous plants of the island. No. 816.

Eucnide cordata Kell. On the beach, but not common. No. 867.

Mentzelia adherens Kell. Common at the mouth of cañons. No. 831.

Passiflora Palmeri Rose, n. sp. Trailing or low-climbing plant, thickly pilose, interspersed with club-shaped glandular hairs throughout: leaves small, about 1 inch long, with 3 obtuse lobes; stipules small, lacerate: tendrils simple, longer than the leaves, pilose: peduncle slender, erect, reflexed in fruit, 1-flowered: involucre bracts 3, small, becoming in fruit a little longer than the stipe, pinnately dissected; segments setaceous, excurrent into a gland: sepals white, 5, broadly linear, $1\frac{1}{2}$ inches long, 3-nerved, the central nerve thickened above, separating below and extending beyond the tip of the sepal: petals 5, 1-nerved, about the length of the sepals: crown in 3 series; outer of short filiform segments a little longer than the tube of the calyx; inner one entire, cup-shaped: staminal tube 8 to 9 lines long, glabrous; free part of filament ribbon-shaped, 5 lines long: ovary very hairy: styles and stigmas 3, glabrous: fruit $1\frac{1}{2}$ inches in diameter, pilose.—Very plentiful on the beach among the loose coral, but rare in the cañons. No. 868.

The plant is called "Sandia de la Passion." The flowers bloom early in the morning and last but a part of the day; the ripe fruit, which has a sweetish taste, is much relished by the children of the island.

This species seems nearest *P. fatida*, some forms of which have very similar foliage, but differs in its larger flowers, smaller crown, longer staminal tube, and the peculiar tip of the sepal.

EXPLANATION OF PLATE XIV.—A branch with flowers and fruit shown; natural size.

Mamillaria Roseana Brandg. Zoe, ii. 19. Common on the hillsides and beach among loose coral rocks. Fruit of a "vermilion color," is edible. Said to be a very handsome species. No. 880.

Cereus gamosus Engelm. Stem 6 feet high, erect; ribs 8 or 9; spines straight and stout; branches numerous, often prostrate upon the ground: mature fruit large, dull red without, bright red within. Not in flower. No. 883.

The fruit is edible; it is used for preserves, jams, etc. It is called "Pitahaya acre."

Vaseyanthus Rosei Cogniaux. Zoe, i. 368. Grows in cañons in shady places and along the beach. No. 837.

This was first collected at La Paz and is No. 102 of Dr. Palmer's collection referred to *Maximowiczia* on p. 70.

Macrosiphonia Berlandieri Gray. About 3 feet high with few branches; only found in fruit. In cañons. No. 841.

Houstonia brevipes Rose. Contr. Nat. Herb. i. 83. In cañons. No. 836.

Houstonia (Ereicotis) fruticosa Rose, n. sp. Upright-growing shrub, 1 to 2 feet high, much-branched, glabrous throughout: leaves linear, 3 to 7 lines long, much fascicled, and with minute stipules: flowers cymose on short pedicels or sessile: corolla 4 to 5 lines long, salver form, the tube much longer than the lobes, "white:" the fruiting calyx 1 line long, with lobes of equal length: capsule a little over 1 line long, free from the calyx at the tip only: seeds oblong.—One of the commonest plants along the beach. No. 885.

Near *H. fasciculata*, but with larger flowers and leaves, and somewhat different in habit.

Hofmeisteria laphamioides Rose. Contr. Nat. Herb. i. 79. Neither in flower nor fruit, but evidently this species. Found on the side of a cañon. No. 850.

Hofmeisteria pubescens Watson. About a foot high with fleshy leaves and pinkish flowers. A compact plant, the numerous branches interlacing form an impenetrable mass. Found on the beach and in the cañons. No. 875.

This plant has somewhat less dissected leaves than the type and approaches near *H. fasciculata*, from which it seems to differ only in being pubescent and in having the leaves more dissected.

Brickellia brachiata Gray, var. *GLABRATA* Rose, n. var. Glabrous throughout, but in other respects similar to the type. This is the glabrous form referred to on page 83, from Santa Rosalia. The finding of this glabrous form a second time indicates that it may be a common form along the Gulf, and being so much out of the range of the type we have thought best to give it a varietal name.—On side of rocky cañons. No. 849.

Aplopappus spinulosus DC. Only a single specimen seen. No. 848.

Bebbia juncea Greene. About 3 feet high. Found on the beach and cañons. No. 844.

Bigelovia diffusa Gray. Commonly called "Yerba del Jasmo." Two to three feet high. Grows on the beach. No. 833.

Viguiera deltoidea Gray, var. *PARISHII* Rose. Contr. Nat. Herb. i. 73. Three to 4 feet high. In the cañons of the island, but not common. No. 828.

Alvordia glomerata Brandegee. Proc. Cal. Acad. ser. 2. ii. 174. About three feet high: flowers orange-yellow, with a strong oily odor. In the cañons; not common. No. 827.

Recently found by Mr. Brandegee at two stations not far away on the mainland.



PASSIFLORA PALMERII n. sp.

W. SCHOLL DEL

Leptosyne dissecta Gray. A compact bushy plant 1 to 2 feet high: leaves more dissected than in the type. Only seen in one cañon. No. 877.

Perityle Emoryi Torr. form. About 2 feet high: leaves very much dissected, rather thick: heads somewhat larger than in type: style-branches with acute tips. Common along the beach and in the cañons. No. 866.

This form was collected on the island by Dr. Palmer in 1890, and made the subject of a short note in Bot. Cal. i. 397, by Dr. Gray. This was also obtained by him last year at La Paz, and by Mr. Brandegee at the same place and time.

Porophyllum crassifolium Watson. Proc. Amer. Acad. xxiv. 57. A very common plant along the beach, in the cañons, and on the mountain side. No. 879.

It was first collected on this island. It was distributed as "*P. tridentatum* Benth." and is in Palmer's collection of 1870 (No. 9).

Porophyllum gracile Benth. Very common on the beach. No. 834.

It is called "Yerba del Venado" and is much used as a tea. This plant was collected in 1870 (No. 16).

Phacelia scariosa Brandegee. Proc. Cal. Acad. ser. 2. ii. 185. Common on the beach. No. 832.

Bourreria Sonora Watson. Proc. Amer. Acad. xxiv. 62. A shrub about 6 feet high. In cañons. No. 822.

Krynitzkia racemosa Greene. In cañons, growing on gravelly soil. No. 846.

Heliotropium Curassavicum L. Very common. No. 869.

Physalis crassifolia Benth. Probably this species, but only a single poor specimen was found. No. 871.

Datura alba Nees. Established in all parts of the island except in the higher parts of the mountains. No. 872.

This seems to be the same as Palmer's Chihuahua plant, referred doubtfully to this species.

Nicotiana trigonophylla Dunal. Only a few plants seen in cañons. No. 873.

Calophanes Californica Rose. Contr. Nat. Herb. i. 85. A branching shrub 2 feet high: corolla purple, $1\frac{1}{2}$ inches long. Common in cañons. No. 829.

This plant is not so tall, and the calyx and corolla are not so large as in the type, but otherwise they seem to agree. This species was also collected by Dr. Palmer on this island in 1870 (No. 8). The specimens undetermined in Gray Herbarium.

Salvia platycheilia Gray. About 3 feet high. Collected in a cañon. No. 878.

This was made the type of a new species in Dr. Palmer's collection of 1870 (No. 7); not since collected until now.

Boerhaavia Wrightii Gray. In very poor condition, but probably this species. No. 845.

Atriplex Barclayana Dietr. Common plant. No. 874.

Stignosperma halimifolia Benth. About 4 feet high. Only a few plants seen. No. 870.

Phoradendron sp. No. 882.

Argemone Brandegei Millsp. Proc. Cal. Acad. ser. 2. ii. 220. It differs from the type in having 10 stamens. No. 839.

Croton Magdalenæ Millsp. Proc. Cal. Acad. ser. 2. ii. 220. No. 821.

Euphorbia polycarpa Benth, var. *VESTITA* Watson. Very common. No. 835.

Euphorbia blepharostipula Millsp. Contr. Nat. Herb. i. 77. Very common on the island. No. 825.

Euphorbia Carmenensis Rose, n. sp. A low, compact plant, woody at base, a span high, with many slender interlacing branches, glabrous throughout: leaves opposite, small, 1 to 2 lines long: involucre very small, $\frac{1}{4}$ line long, axillary, subsessile: glands 5, naked: seeds reddish, smooth, $\frac{1}{4}$ line long.—In cañons and on mountain sides. No. 842.

A peculiar species. Our plant is abundantly covered with small oblong bodies, appearing like capsules, which are the result of insect work.

Simmondsia Californica Nutt. In cañons, but not common. No. 817.

Called "Jojo baberry."

Sporobolus argutus Kunth. No. 856.

Panicum lachnanthum Vasey and Scribn. No. 855.

Panicum fasciculatum Vasey and Scribn. No. 864.

Muhlenbergia debilis Trin. No. 853.

Setaria setosa Beauv. No. 857.

Aristida dipersa Trin. No. 858.

Bouteloua aristidoides Thurb. No. 859.

Bouteloua polystachya Torr. No. 854.

Bouteloua racemosa Lag. No. 861.

Heterpogon contortus R. and S. No. 860.

Diplachne Brandegei Vasey. No. 862.

Cenchrus Palmeri Vasey. No. 865.

Cyperus. Too young for determination. No. 863.

—— Indeterminable shrub. A shrub 3 feet high, 4 inches in diameter, with numerous horizontal branches: leaves fasciated. Neither in fruit nor flower. Common near the beach. No. 881. It may be *Jatropha spatulata* Muhl. A *Phoradendron* is parasitic upon it.

—— A long, slender, cactus-like plant. No. 794.

LIST OF PLANTS COLLECTED BY THE U. S. S. ALBATROSS IN 1887-'91 ALONG THE WESTERN COAST OF AMERICA.

The Division of Botany has from time to time reported upon collections made by the *Albatross* in its various cruises along the American coast and among the islands of the Pacific. The collections here enumerated were made at various times, extending as far back as 1887. The first and second parts are reports by Mr. J. N. Rose on collections made by Prof. Alexander Agassiz¹ on Cocos and the Galapagos islands; the third part is a list of ferns from southern Patagonia, which have been determined by Prof. Daniel C. Eaton, of Yale College; the fourth part is a report on the mosses from Fuegia and Patagonia, also by Prof. Eaton, giving notes, synonymy, and bibliography, besides the description of a new species; the fifth part is a list of Liverworts from southern Patagonia, by Mr. A. W. Evans, with descriptions and illustrations of two new species; the sixth part contains a short list of the lichens from southern Patagonia by J. W. Eckfeldt, of Philadelphia.

All the material upon which these reports are based has been mounted and preserved in the National Herbarium.

I. LIST OF PLANTS FROM COCOS ISLAND.

By J. N. ROSE.

The few plants here enumerated were gotten by Mr. Alexander Agassiz in 1891, who seems to have spent but a single day (February 28) on this island.

This island lies southwest of Panama about 500 miles, in latitude 5° 35' and longitude 87°.

Ipomœa pes-capræ Sweet.

Epidendrum sp. These specimens have neither flower nor fruit.

Paspalum vaginatum Swartz.

Polypodium sp. Three different species were obtained.

Nephrodium pectinatum Presl. I have not seen specimens of this species, and it is doubtfully referred here.

*Meteorium patens*² Dozy and Molkenboer. "This seems to be *M. patens* of Dozy and Molkenboer, judging by their figure; but it is *not* the same as the Wilkes expedition specimen nor C. Wright's from Cuba. These have a shorter, rounded, and flatter leaf. *M. aureum*, from Java, is a good deal like the Cocos Island specimen."—D. C. E.

¹ A full account of Prof. Agassiz's cruise is to be found in the Bulletin of Comparative Zoölogy of Harvard College, Vol. xxiii, No. 1.

² Determined by Daniel C. Eaton.

2. LIST OF PLANTS FROM GALAPAGOS ISLANDS.

By J. N. ROSE.

These islands are ten in number, situated on the equator, and are 300 to 600 miles from the mainland of South America.

Two large collections have been made from these islands; First, that of Charles Darwin in 1835, who obtained about 200 species; and second, that of N. J. Andersson in 1851.

David Douglass, with Dr. Scouler, also spent several days on these islands in 1825. Of the 150 species obtained by Douglass only 50 were saved, and these in very poor condition. Hugh Cummings made a small collection in 1829. Mr. Macrae also made a large collection, and Mr. Edmonstone, in 1845, collected largely here. Admiral Du Petit-Thouars obtained a few species. In 1845 Sir Joseph Hooker published the first enumeration of the plants of these islands. He reports upon 265 species, of which 253 are phanerogams and ferns, and of this number 123 are described as new. In 1861 N. J. Andersson published the second enumeration, being a report upon his collection (made in 1852) and including all the previous collections. He enumerates 392 species, of which 372 are phanerogams and ferns, and of these 72 are described as new.

MALVACEÆ.

Gossypium purpurascens Poir. (?) Duncan Island, April 2. This is probably the same plant that both Hooker and Andersson referred to the above species. It is certainly near *G. Barbadosense* L., but the leaves are more strongly black-dotted than in any of the species in the National Herbarium. The flowers appear to be yellow.

ZYGOPHYLLACEÆ.

Tribulus maximus L. Duncan Island. April 2.

I am not able to separate this from the many forms of this species. I suppose it is the same as the variety **adscendens** of Andersson, who obtained it from both Charles and Chatham islands.

Tribulus servicens Ands., var. **HUMIFUSUS** Ands. Leaflets 7 pairs; petals 5 lines long; carpels 5, one abortive.—Charles Island. April 1.

Also obtained here by Andersson. Only two small specimens were obtained, but these have both flower and fruit. The original description contains no reference to the flowers and their size is given above. The flowers are considerably larger than *T. terrestris*, to which it is nearly related.

GERANIACEÆ.

Oxalis (**Hedysarioideæ**) **Agassizi** Rose, n. sp. Annual, erect, simple or branched, glabrate; the younger parts hairy, 6 to 12 inches high; leaves on petioles 1 to 1½ inches long; leaflets 3, the odd one distinct, the lateral on short petiolules, broadly obovate, 6 to 9 lines long, 5 to 8 lines broad; surface finely reticulated, resembling a minute honeycomb; peduncle about the length or longer than the leaves; flowers few, yellow; ovary oblong, obtuse, 3 lines long.—Duncan Island. April 2.

Three other species have been found on these islands, viz: *O. carnosus* Molina, *O. Cornelli* Ands. and *O. Barreliari* Jacq., with none of which it agrees. It belongs to the same section as the last species, but differs in its annual habit, color of flowers, etc.

LEGUMINOSÆ.

- Crotalaria glabrescens* Ands. (?) Calyx not glabrous. Chatham Island. March 30.
Parkinsonia aculeata L. Chatham Island. March 30.
Cassia occidentalis L. Chatham Island. March 30.
Cassia picta Don. Chatham Island. March 30.
Desmanthus depressus Humb. and Bonpl. The specimens were very poor, but it is probably this species as this is the only one known from this island. Chatham Island. March 30.

PASSIFLORACEÆ.

- Passiflora foetida* Cav. Charles Island, April 1, and Chatham Island, March 30.

COMPOSITÆ.

- Lipochæta laricifolia* Gray. Only a single specimen was found on Charles Island, April 1.
 This was originally described as a new genus by Dr. Hooker, but was afterwards disposed as above by Dr. Gray.
Chrysanthellum pusillum Hook. Charles Island, April 2, and Chatham Island, March 28.
Porophyllum ellipticum Cass. Chatham Island. March 28.

BORAGINACEÆ.

- Cordia lutea* Lam. Charles Island, April 1, and Duncan Island, April 2.
 I have followed Sir Joseph Hooker in referring this plant to *C. lutea*, as I have not been able to clearly separate it specifically. The acceptance of Andersson's conclusions would now require a new combination of names, and until further material can be examined it had better remain under the old name.
Heliotropium Curassavicum Gray. Chatham Island. March 30.

CONVOLVULACEÆ.

- Ipomœa*, sp. Flowers 4 to 5 inches long.
Evolvulus glabriusculus Choisy. Charles Island. April 2.

SOLANACEÆ.

- Physalis angulata* L. Charles Island. April 1.

VERBENACEÆ.

- Lantana*, sp. Charles Island. April 2.
Lippia lanceolata Michx. Chatham Island. March 30.
 Only a single specimen collected. This plant is not reported either by Hooker or Andersson.
Clerodendron molle H. B. K. Charles and Chatham islands.

CHENOPODIACEÆ.

- Telanthera*, sp. Chatham Island. March 30.
Telanthera echinocephala Moqu. (†) Charles and Chatham islands.

EUPHORBIACEÆ.

- Euphorbia nummularia* Hook. Chatham Island. March 30.
Euphorbia articulata Ands. Chatham Island. March 30.
Croton, sp. Charles Island. April 1.
Acalypha diffusa Ands. Chatham Island. March 30.

CYPERACEÆ.

Cyperus confertus Swartz, fide N. L. Britten. Charles Island. April 2. Chatham Island. March 30.

GRAMINEÆ.

Panicum hirticaulon Presl. Chatham Island. March 30.

Panicum fuscum Swartz. Chatham Island. March 30.

Eleusine indica Gaertn. Chatham Island. March 30.

Dachyloctenium Ægyptiacum Willd. Chatham Island. March 30.

Distichlis. Chatham Island. March 30.

HEPATICÆ.

Plagiochila Anderssonii.¹ Angstr. in Ofver af Kongl. Vetensk.—Akad Jorbandl, 1873, No. 5, p. 114. On roots of *Parkinsonia aculeata*.

3. LIST OF FERNS FROM SOUTHERN PATAGONIA.

By DANIEL C. EATON.

Lycopodium Magellanicum Swartz. Mayne Harbor.

Gleichenia quadripartita Hook. Borja Bay and Island Harbor.

Alsophila pruinata Kaulf. Port Otway.

Hymenophyllum cruentum Cav. Island Harbor.

Hymenophyllum candiculatum Mart. Port Otway.

Hymenophyllum secundum H. and G. Port Otway and Mayne Harbor.

Hymenophyllum pectinatum Cav. Island Harbor and Mayne Harbor.

Hymenophyllum tortuosum H. and G. Island Harbor and Mayne Harbor.

Lomaria L'Herminieri Borg.

Lomaria procera Spreng.

Lomaria Boryana Willd. Borja Bay and Mayne Harbor.

Aspidium aculeatum Swartz.

Polypodium australe Mitten. Mayne Harbor.

4. LIST OF MOSSES FROM FUEGIA AND PATAGONIA.

By DANIEL C. EATON.

There are only 10 true mosses in this collection, while not less than 152 species are attributed to Fuegia. It is to be hoped that as United States Government vessels pass through the Straits of Magellan some person may be willing to gratify American bryologists by making large collections of these interesting plants.

Dicranum robustum Hook. f. et Wils. Fl. Antaret. 406 t. 152, f. 8. Port Churrucá, Straits of Magellan. A form with nearly straight leaves. Var. *PUNGENS* Hook. f. Handbook of New Zealand Flora, p. 412, was collected at Island Harbor, Patagonia. It has the leaves more falcate and with even slenderer capillary points.

Dicranum imponens Montagne. Ann. d. sc. nat. t. xvi. 241. *D. involutifolium* Sulliv. in Hook. Journ. of Bot. 1850, p. 316. Borja Bay, Straits of Magellan. Two forms were collected, one with stems 6 inches long, the other only 2 inches high and of a darker color.

¹ Determined by A. W. Evans, New Haven, Conn.

Racomitrium rupestre Hook. f. et Wils. Fl. N. Z. ii. 75. *Dryptodon rupestris*, Hook. f. et Wils. Fl. Antarct. p. 402, t. 152, f. 1. Port Churruca, Straits of Magellan; barren plants. The plants have a yellowish brown color instead of the lurid brown of the original description, but seem to differ in no other respect.

Racomitrium lanuginosum Bridel. Mayne Harbor, Patagonia; not in fruit.

Ulota fulvella Mitten. Journ. Linn. Soc. iv. 75. Borja Bay, Straits of Magellan, growing on *Berberis ilicifolia*, in fruit. This is one of four species (*U. fulvella*, *U. eremitensis*, *U. glabella*, and *U. Fuegiana*) into which Mr. Mitten divided the *Orthotrichum luteolum* of the Flora Antarctica. The pedicels are 3 to 5 times the length of the capsules, while Mr. Mitten's description makes them only twice as long, but the leaves agree with his character of "margined with a single row of oblong hyaline cells." The inner peristome he was unable to find. These specimens show it to be composed of eight slender cilia, about half the length of the outer teeth, each of a single row of cells.

Bryum cœlophyllum, Eaton n. sp. Plant half an inch high, densely caespitose and matted with brown branching radicles; stems slender, mostly simple, not comose-capitate; leaves consimilar, loosely imbricated when dry, erect-spreading when moist, broadly roundish-ovate from a wide and scarcely decurrent base, very concave, obscurely pointed, margins erect or slightly incurved, entire, nerve rather stout, extending almost to the apex; cells of the leaf rhomboid-hexagonal, hyaline, those along the margin longer and narrower except near the base and the apex; flowers and fruit unknown.

Port Churruca, Straits of Magellan. A densely tufted plant with something the appearance of the specimens of *B. nirale* collected by the Wilkes exploring expedition, but the leaves here are shorter, broader, firmer, more concave, and comparatively pointless. They measure 1.65 to 1.75 mm. in length, and are nearly as broad, though it is difficult to measure their width, as under a cover-glass they are forced into several longitudinal folds. The average length of the leaf-cells is 0.05 mm. The color is a dull green, becoming brownish as the leaves grow older. *B. platyphyllum*, as figured by Schwægrichen (t. 324) has leaves much like those of this moss, but differs in having the ends of the stems and branches comose-capitate.

Cœlidium cochlearifolium Jaeg. et Sauerb. Adumbr. ii. p. 383. *Hypnum cochlearifolium* Schwægr. Suppl. i. sect. ii. p. 221, t. 88. Port Otway, Patagonia; in fruit, the plant growing on a slender twig, and with long straggling branches like a *Meteorium*. The allied species, *C. auriculatum*, though originally discovered in the Straits of Magellan, is not in this collection. It has more decidedly auriculate leaves and a much longer pedicel than the present species.

Ptychomnion aciculare Jaeg. et Sauerb. Adumbr. ii. 616. *Hypnum aciculare*. Labill. Schwægr. Suppl. t. 92. *Hypnum cygnisetum* C. Müll. Bryologia Fuegiana, in "Flora," 1885, p. 425. Port Otway, Patagonia; not in fruit. Müller has separated the American from the New Zealand plant on account of its greater robustness and its swan-necked pedicel. But some of the New Zealand specimens are even stouter than the Patagonian, and the curved pedicels are found also in New Zealand.

Hypnum fluitans L. Patagonia. Sterile specimen rather denser than the common forms of this species; possibly *Amblystegium Fuegianum* Mitten.

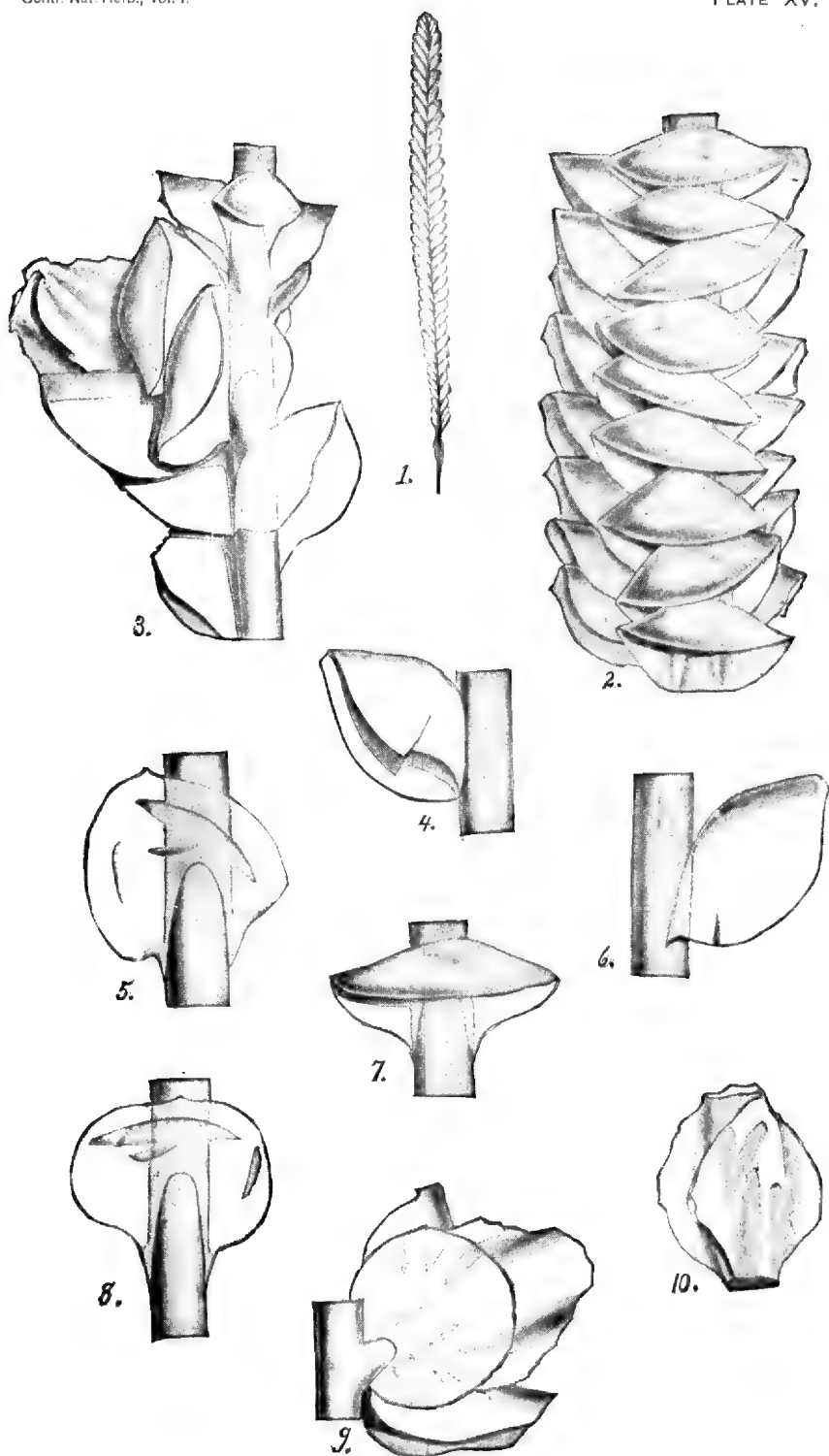
Hypopterygium Thouini Mont. in Ann. d. sc. Nat. ser. 3, iv. 86. *Hypnum Thouini*, Schwægr. Suppl. t. 289. Port Otway, Patagonia; in fruit. C. Müller, in Bryol. Fuegiana, expresses a doubt as to this moss having been found by Commerson in Fuegia. In the Flora Antarctica it is stated that Capt. King gathered it at Port Famine. The present fine specimens amply confirm the southern range of the species.

5. LIST OF LIVERWORTS FROM SOUTHERN PATAGONIA.

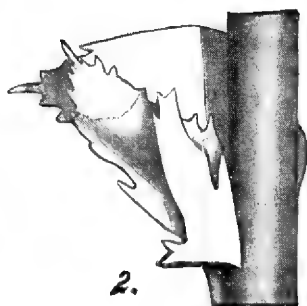
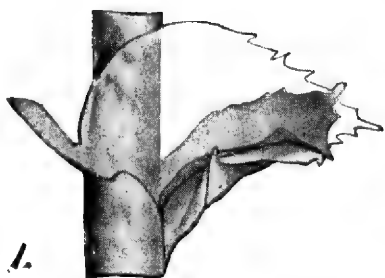
By A. W. EVANS.

- Lejeunea Spruceana** Massal. in Nuovo Gior. Bot. Ital. xvii. 246, t. xxiv, f. 27.
- Porella foetens** Trevis. Nuov. Class. Ep. p. 25 (*Madotheca foetens* De Not. in Mem. Acc. Tor. ser. ii. T. xvi. 231, f. 17).
- Lepidolæna Menziesii** Dum. Rev. des Genres, p. 13 (*Jungermannia Menziesii* Hook. Musc. Exot. t. cxviii: *Polyotus Menziesii* Gottsche in G. L. et N. Syn. Hep. p. 247).
- L. Magellanica** (*Jungermannia Magellanica* Lam. in Schwaegr. Prod. p. 14, t. i; Hook. Musc. Exot. t. cxv: *Polyotus Magellanicus* Gottsche in G. L. et N. Syn. Hep. p. 248). Straits of Magellan.
- Herberta Chilensis** Trevis. Nuov. Class. Ep. p. 15 (*Sendtnera Chilensis* De Not. in Mem. Acc. Tor. ser. ii. T. xvi. 228, f. 14; *Schisma Chilense* Massal. in Nuovo Gior. Bot. Ital. xvii. 251, t. xxv, f. 31). Mayne Harbor and Port Churruca.
- Lepicolea ochroleuca** Lindb. in Acta Soc. Sc. Fenn. x. 516 (*Sendtnera ochroleuca* Nees in G. L. et N. Syn. Hep. p. 240). Mayne Harbor and Port Churruca.
- Isotachis Spegazziniana** Massal. in Nuovo Gior. Bot. Ital. xvii. 220, t. xvi. f. 10. Port Churruca.
- Cephalozia scabrella** Massal. in Nuovo Gior. Bot. Ital. xvii. 233, t. xx. f. 19. Mayne Harbor.
- Adelanthus unciformis** Spruce in Journ. Bot. xiv. (*Plagiochila unciformis* Hook. f. et Tayl. in G. L. et N. Syn. Hep. p. 563: *P. sphenoloba* Hook. f. et Tayl. l. c. p. 563: *Jungermannia* (Plag.) *unciformis* Hook. f. et Tayl. Fl. Ant. ii. 425, t. clvi. f. 5: *J. sphenoloba* Hook. f. et Tayl. l. c. p. 427, t. clvi. f. 8). Borja Bay.
- Schistocalyx chloroleuca** Lindb. in Journ. Linn. Soc. xiii. 185 (*Scapania chloroleuca* Tayl. in G. L. et N. Syn. Hep. p. 662: *Jungermannia* (Scap.) *chloroleuca* Hook. f. et Tayl. Fl. Ant. ii. 433, t. clxi. f. 5: *Blepharidophyllum vertebrale* Ångstr. var. *chloroleucum* Massal. in Nuovo Gior. Bot. Ital. xvii. 208). Port Churruca.
- Lophocolea obvolvæformis** Massal. in Nuovo Gior. Bot. Ital. xvii. 223 (*Jungermannia obvolvæformis* De Not. in Mem. Acc. Tor. ser. ii. T. xvi. 220, f. 8). Borja Bay.
- L. fulvella** Massal. in Nuovo Gior. Bot. Ital. xvii. 227 (*Jungermannia fulvella* Tayl. in Hook. f. Fl. Ant. ii. 432, t. clviii. f. 1: *Chiloscyphus fulvellus* Nees in G. L. et N. Syn. Hep. p. 711). Island Harbor.
- L. apiculata** Evans n. sp. Loosely caespitose, pale green, turning blackish-brown with age; stems mostly simple, rarely giving off one or two lateral branches; leaves alternate, approximate or arched-imbricated, dorso-ventrally compressed, the line of insertion being a sharp parabolic curve, broadly ovate-orbicular, entire, the dorsal margin abruptly decurrent, slightly cordate towards the base, the ventral margin more gradually decurrent, not cordate, the apex rounded, apiculate; amphigastria mostly subimbricated, strongly reflexed or revolute, about as large as the leaves, orbicular-reniform, entire, long-decurrent on both sides, the apex broad, apiculate; perianth terminal on a very short lateral branch, ovate, broadly 3-winged, the wings and mouth irregularly crenulate; involucrel leaves one pair, similar in size and shape to the stem-leaves, slightly crenulate, scarcely decurrent; involucrel amphigastrium reflexed, orbicular, crenulate, free from the involucrel leaves; andræcia not seen.

Plants 7-10 cm. long, with the leaves, 3-4 mm. wide; leaves and amphigastria 2-3 mm. wide; leaf-cells thin-walled, 5- or 6-sided, becoming larger and rectangular in the decurrent portions, in the middle of the leaf averaging 0.044 mm. in diameter, on the borders, 0.034 mm.—Port Churruca.



LOPHOCOLEA APICULATA n. sp.



F. Muller del.

SCHISTOCHILA QUADRIFIDA n. sp.

This curious species is very doubtfully referred to the genus *Lophocolea*, from whose typical species it differs especially in the large, entire amphigastria and in the extremely short fertile branch with its involueral leaves reduced to a single pair. The sharply curved line of insertion of the leaves (which is similar to that found in certain *Plagiochila*) also distinguishes it from most *Lophocolea*, where the leaves are rarely deeply decurrent ventrally. It differs from *Chiloscyphus* in the position of the fertile branches and in the winged perianths.

EXPLANATION OF PLATE XV.—Fig. 1, stem, natural size; fig. 2, part of stem, ventral view; fig. 3, part of stem with fertile branch, the latter seen dorsally; fig. 4, leaf, ventral view; fig. 5, leaf, spread out, lateral view; fig. 6, leaf, dorsal view; fig. 7, amphigastrium, natural appearance; fig. 8, amphigastrium, spread out; fig. 9, fertile branch, ventral view, the amphigastrium spread out; fig. 10, perianth, dorsal view.

Chiloscyphus pallide-virens Tayl. in G. L. et N. Syn. Hep. p. 178 (*Jungermannia* (Chil.) pallide-virens Hook. f. et Tayl. Fl. Ant. ii. 439, t. clix. f. 9). Borja Bay.

C. grandifolius Tayl. in G. L. et N. Syn. Hep. p. 185 (*Jungermannia* (Chil.) grandifolia Hook. f. et Tayl. Fl. Ant. ii. 440, t. clix. f. 8).

C. surrepens Tayl. in G. L. et N. Syn. Hep. p. 179 (*Jungermannia* (Chil.) surrepens Hook. f. et Tayl. Fl. Ant. ii. 440, t. clx. f. 1).

Plagiochila distinctifolia Lindenb. (?) Spec. Hepat. Fasc. i. 17, t. iii; G. L. et N. Syn. Hep. p. 30. Port Otway, attached to *Hymenophyllum secundum*.

P. hirta Tayl. in Hook. f. Fl. Nov. Zeal. ii. 134; Massal. in Nuovo Gior. Bot. Ital. xvii. 209, t. xiii. f. 4.

P. duricaulis Hook. f. et Tayl. in G. L. et N. Syn. Hep. p. 641 (*Jungermannia* (Plag.) duricaulis Hook. f. et Tayl. Fl. Ant. ii. 426, t. clvi. f. 9). Port Otway and Island Harbor.

Jungermannia colorata Lehm. in Linnaea iv. 366; G. L. et N. Syn. Hep. pp. 86 et 673. Borja Bay. Var. *ARCTA* Massal. in Nuovo Gior. Bot. Ital. xvii. 215 (J. arcta De Not. in Mem. Acc. Tor. ser. ii. T. xvi. 219, f. 6). Mayne Harbor.

J. involutifolia Mont. in Voyag. au Pôle Sud, I, Bot. Crypt. p. 259; G. L. et N. Syn. Hep. p. 81; De Not. in Mem. Acc. Tor. ser. ii. T. xvi. p. 216, f. 4. Borja Bay.

Schistochoila lamellata Dum. Rev. des Genres, p. 15 (*Jungermannia lamellata* Hook. Musc. Exot. t. xlix; *Gottschea lamellata* Nees in G. L. et N. Syn. Hep. p. 20). Port Churruca.

S. laminigera (*Gottschea laminigera* Tayl. in G. L. et N. Syn. Hep. p. 623; *Jungermannia* (*Gottschea*) laminigera Hook. f. et Wils. in Fl. Ant. ii. 425, t. clvi. f. 4). Borja Bay.

S. stratosa (*Gottschea stratosa* Mont. in G. L. et N. Syn. Hep. p. 620).

S. quadrifida Evans n. sp. Sterile, grayish or brownish green; stems simple, with purple radicles; leaves spreading obliquely, contiguous or slightly imbricated, complicate, bilobed about one-fourth their length; dorsal lobe broader than the ventral, ovate or falcate-ovate, arching over the stem, somewhat cordate at base and often produced into a small, irregular, ligulate or cuneate auricle, the margin sharply toothed toward the ciliate-dentate apex, otherwise sub-entire; ventral lobe more or less convolute, ovate-lanceolate, deeply lobed and usually reflexed at base, the margin and apex coarsely toothed; both dorsal and ventral lobes extending backwards as narrow, sinuous or toothed laminae, that of the ventral lobe being more or less decurrent; amphigastria contiguous, plicate, broadly quadrifid, the lobes unequal, strongly and coarsely dentate or ciliate.

Stems 4 cm. long; leaves 1.5–2 mm. long, 1.25–1.75 mm. wide when explanate; amphigastria 1 mm. × 1.25 mm.; leaf-cells 0.034 mm. in diameter in middle of leaf.

EXPLANATION OF PLATE XVI.—Fig. 1, a leaf, dorsal view; fig. 2, a leaf, ventral view; fig. 3, a leaf, spread out; fig. 4, an amphigastrium, spread out.

Aneura multifida Dum. (?) Comm. Bot. p. 115; G. L. et N. Syn. Hep. p. 496. Mayne Harbor and Borja Bay. Sterile specimens, doubtfully referred to this species.

A. Fuegiensis (Riccardia Fuegiensis Massal. in Nuovo Gior. Bot. Ital. xvii. 255, t. xxvi. f. 34).

Anthoceros endiviaefolius Mont. in Voyag. au Pôle Sud, I, Bot. Crypt. p. 211; G. L. et N. Syn. Hep. p. 590. Borja Bay.

6. LIST OF LICHENS FROM SOUTHERN PATAGONIA.

By J. W. ECKFELDT.

Cladonia rangiferina var. **SYLVATICA** Hfm. Mayne Harbor.

Nephroma antarcticum Jaeg.

Cora¹ pavonia Web. Island Harbor.

Pannaria subcinnata Nyl.

Sphærophoron australe Laur.

Stricta Freycinetii Del.

Stricta Urvillei Del. var. **FLAVICANS** Hook.

¹ It is technically a lichen, having gonidia interspersed among the hyphae, but it is usually classed among the *Fungi*. The genus stands next to *Thelophora* among the Hymenomyces. The plant *has nothing to do with* *Ladina pavonia*, though it resembles it in general appearance.—D. C. EATON.

REVISION OF THE NORTH AMERICAN SPECIES OF HOFFMANSEGGIA.

By E. M. FISHER.

In this paper species of the United States and Mexico are included. Foreign species are omitted except where they extend into this country. The genus is taken as commonly defined, no attempt being made except to present a synoptical view of the species. This revision is based upon the material contained in the National Herbarium, in which nearly all the species are fully represented, and which has been placed in my hands through the kindness of Dr. George Vasey. I am also indebted to Dr. Sereno Watson, Dr. John M. Coulter, Dr. William Trelease, Mr. John Donnell-Smith, and Mr. I. C. Martindale, who have placed at my disposal the collections which they own or have in charge. I am especially indebted to Dr. Coulter for his many suggestions and his assistance at difficult points. The compound microscope was used continually throughout these observations, and is indispensable in testing many relationships.

Historical sketch.—This genus was established by Cavenilles, and published in his *Icones* iv. 63 (1797), as containing two species, *H. falcaria* and *H. trifoliata*. Two years later (1799), in *Icones* v. 1. t. 402, he published the genus *Pomaria*, including one species, *P. glandulosa*. De Candolle defined the genus *Melanosticta* and published it in his *Memoires Leguminosæ* xii (1835), including one species, *M. Burchellii*. Torrey and Gray (*Fl. N. A.* i. 392) united them all without hesitation. Up to that time (1840) there were only 3 or 4 species described in North America. At the present time 15 species and 9 varieties have come under my observation, of which 2 species and 4 varieties seem to have been undescribed.

Characters.—The glands furnish the first and most important group of characters, and in several instances furnish specific distinctions. They may be thrown into two different divisions: stipitate glands and black sessile (or subsessile) glands. The former belong to *Hoffmanseggia* proper (having petals with long claws) and the old genus *Pomaria* (having petals with short claws); while the latter are characteristic of the old genus *Melanosticta*. Another group contains both kinds. The *Melanosticta* group is further separated into three divisions by the characters of the glands on the flowers, which is sufficient to clear up

the confusion concerning *H. Jamesii* and *H. melanosticta*. The claws of the petals and the style furnish some important characters. The pod furnishes some of the most important specific distinctions, but can not be of prime importance in grouping, for the fruit of a species and its varieties may differ widely.

SYNOPSIS.

§ 1. *Stipitate-glandular* (except No. 4): *ovate stipules and ovate attenuate bracts membranaceous; leaflets oblong, nerveless: filaments straight, with short and thick hairs.*

* *Claws of petals long, densely glandular, that of vexillum thick and usually broadly dilated: filaments and oblong ovary glandular: style clavate, slightly beaked: pod falcate and with persistent sepals: herbaceous.*

1. *H. falcaria* Cav. Ic. iv. t. 392 (1797). Stems procumbent, 2 to 25 cm. high, from a creeping root (bearing now and then a tuber), puberulent, sparsely glandular, scarious at base: leaves with 7 to 11 pinnae; leaflets 6 to 10 pairs, puberulent or glabrate; stipules broadly ovate, scarcely acute: peduncle usually short, bearing a raceme of few flowers on suberect pedicels: sepals scarcely acute, 4 to 5 mm. long: petals with inner edge of claw densely glandular as well as back of vexillum which has a thick dilated claw: outer stamens with copious clavate glands: pod falcate, 3 to 4 cm. long, with round apex and acute base, on recurved pedicel, more or less glandular, compressed between the 8 to 12 dark obovate seeds.

Habitat: From Southern Arizona through Mexico (San Luis Potosi) to Chili and Patagonia.

Specimens examined: Arizona (Lemmon, 1881, in part); San Luis Potosi (Schaffner 832, 1876); Argentine Republic (at Cordova, 1829; Patagonia, Andrews 333); Chili (Morong 1191; Phillip's distribution 1324); also specimens cultivated at the botanical gardens of Montpellier (1824) and Delile (1821).

This polymorphic species has a wide distribution, and has been heretofore divided into several species and varieties. The specimens found in the United States and Mexico have been called *H. stricta* with its var. *demissa*, and *H. densiflora*, while those of South America and those cultivated in France have been called *H. falcaria*. Mr. Benthams remarks that "the above species (*H. stricta*, *demissa* and *densiflora*) agree with *H. falcaria* in their most important characters," but does not state how they differ. The only difference yet noticed between the North and South American forms is that the latter have ovaries with fewer glands and the corolla is often a deeper yellow; otherwise they agree. Some of the Morong specimens are very low, erect, very glandular, with rather dense racemes; while others are 45 cm. high, with long loose racemes. It differs from var. *stricta* in being procumbent and having the mature fruit rounded at apex, approaching that of *H. drepanocarpa* in most respects. The Schaffner and Lemmon specimens agree with the description of *H. falcaria*, but they agree more with the plants themselves. The following seem to be well marked varieties:

Var. STRICTA. Erect, 10 to 30 cm. high: stipules obtuse, villous on margin: peduncles long, bearing a loose raceme of suberect flowers: sepals obtuse: vexillum with claw usually more dilated: pod long, obtuse or acute, usually on spreading pedicels; seeds 6 to 9.

H. stricta Benth. in Gray, Pl. Wright. i. 56.

From Kansas southwestward through the United States and northern Mexico to Zacatecas and Lower California.

Specimens examined: Kansas (Bell, 1867); Texas (Reverchon 162, 806; Nealley 112, 335, 478; Vasey, 1881, 1882, 132; Wright 1025; Gerard 48; Leroy distribution); Arizona (Palmer, 1885, 1889, 59 in part; Rothrock, 1875, 351; Lemmon, 1880, in part,

34; *Smart*, 1867); California (*Vasey*, 1881; *Parish* 1410); San Luis Potosi (*Parry* and *Palmer* 202); Coahuila (*Palmer* 267, 268); Mexico (*Coulter* 488, type; *Gregg* 148, type; *Farlow* 182); Lower California (*Brandege*, 1889).

Type in Gray Herbarium.

Var. *DEMISSA*. Low, 7 to 20 cm. high, erect: raceme short peduncled, with few flowers on spreading pedicels which are recurved in fruit: vexillum with claw shorter, broader, and more dilated: pod smaller (3 cm. long), obtuse, slightly curved, usually constricted at one or more places.

H. demissa Benth. MS.

H. stricta, var. *demissa* Gray, Pl. Wright. i. 56.

H. densiflora Benth. in Gray, Pl. Wright. i. 55.

Habitat: Southern Arizona and New Mexico, Northwestern Texas, and San Luis Potosi near Saltillo.

Specimens examined: Arizona (*Palmer* 59; *Cous* and *Palmer* 238, in part); New Mexico (*Wright* 2026); Texas (*Wright* 148; *Thurber* 99; *Reverchon*; *Vasey* 1181, in part); Pope 1st Exp., place and no. not given; Coahuila (*Gregg* 268, type); Mexico (*Schumann* 182).

Type in Gray Herbarium.

Var. *RUSBYI*. Strict, 18 to 20 cm. high, scarcely branched, with the thick stems, petioles, and peduncles glandular above: leaves few, 10 to 13 cm. long; pinnae 9 to 13 (usually 11); stipules very thin, acute, puberulent, few villi on margin: flowers large: sepals broad, thin, subacute, almost naked; lamina of petals broad, that of vexillum circular and densely glandular, with claw broad, thicker, with one dilation or none: style thick.

Habitat: Ungus Springs, New Mexico.

Specimens examined: New Mexico (*Rusby* 111, type).

Type in Herb. J. Donnell-Smith and Missouri Botanical Gardens.

Var. *PRINGLEI*. Subscapitose, with the spreading branches 10 to 17 cm. high: upper stems and petioles slightly glandular: stipules pointed, villous: raceme subcapitate before anthesis, densely villous, on short peduncles: flowers large, on short pedicels: petals broad, shorter clawed, the vexillum with claw broadly dilated.

Habitat: Santa Cruz Valley (near Tucson), Arizona.

Specimens examined: Arizona (*Pringle*, 1881, in part, type).

Type in Herb. Gray, Coulter (authentic), J. Donnell-Smith, Canby and Martindale.

The very low, densely racemed and glandular forms, distributed under this number, belong to the next.

Var. *CAPITATA*. Very low, 5 to 9 cm. high, with the simple stems, foliage and inflorescence loosely subvillous and covered (except leaflets) with large, dark capitate glands: leaves 3 to 5, small; pinnae 5 to 9; leaflets subelliptical: raceme subcapitate on very short peduncle: flowers 6 to 12, small, pendent on short pedicels.

Habitat: Santa Cruz Valley (near Tucson), Arizona.

Specimens examined: Arizona (*Pringle*, 1881, in part). Flowering parts like the last, except much smaller.

Type in Herb. Gray, Coulter, Canby, J. Donnell-Smith and Martindale.

***Petals with short claws, few or no glands, the vexillum with claw scarcely or not dilated: stipules acute.*

+ *Vexillum with narrow claw: filaments glandless: stems low and herbaceous.*

-- *Style subclavate: pod falcate.*

2. *H. drepanocarpa* Gray, Pl. Wright. i. 58 (1852). Spreading, glandless throughout, cinereous-puberulent, with several short stems from a thick ligneous perpendicular root, and bearing the slender peduncles (12 to 30 cm. high) of the elongated and loose raceme of few slender flowers: pinnae 7 to 11; leaflets 8 to 10 pairs: sepals slightly shorter than the very short-clawed petals: pod strongly falcate, on spread-

ang pedicels, rounded at both ends, reticulated, compressed between the 7 to 11 broadly obovate seeds.

Habitat: From Colorado to Texas and throughout southwestern United States.

Specimens examined: Colorado (*Brandegee*, 1874, 1877, 527; *Porter*, 1874); New Mexico (*Vasey*, 1881; *Wright* 352, type, 1027, type in part); Texas (*Vasey* 132, 1881); Arizona (*Pringle* 43; *Lemmon*, 1881; *Kothrock* 1008; *Cous* and *Palmer* 513; *Le Roy's* distribution); California (*Vasey*, 1881).

Type in Herb. Gray and Missouri Botanical Gardens.

3. *H. oxycarpa* Benth. in Gray. Pl. Wright. i. 55 (1852). Plant, 10 to 20 cm. high, slender, villous, glandular, from a subfrutescent base: pinnae, 7 to 11; leaflets 5 to 9 pairs, slender, glabrous or subvillous, glandular, stipellate; raceme rather dense, with several small and pendent flowers: sepals glandular on margin: petals almost naked: style glabrous, slender: pod broadly falcate, 25 by 7 mm., very acute, long stipitate, glandular, with 3 to 6 dark brown seeds.

Habitat: From western Texas to Arizona and through northeastern Mexico to Monterey.

Specimens examined: Texas (*Wright* 1024, 147; *Neally* 111, 798); Nuevo Leon (*Dr. Gregg*, 1847, type; *Edwards & Eaton* 12, type).

Types in Herb. Gray.

+++ Style cylindrical, bell-shaped above: pod linear-oblong.

4. *H. gracilis* Watson Proc. Am. Acad. xvii. 347 (1882). Low (10 to 16 cm. high), puberulent, with very slender stems and branches, glandless: pinnae 3 to 7; leaflets 5 to 8 pairs, glabrate, glandular, stipellate; stipules acute or attenuate racemes loose, with a few suberect flowers on very long pedicels; sepals concave, oblong-obovate, blunt; vexillum with claw rather narrow: filaments with obtuse pubescence: style pubescent: pod slightly curved, 25 by 5 mm., acute, suberect on spreading pedicels, scarcely glandular, compressed between the 6 to 9 seeds.

Habitat: Coahuila, 40 miles south of Saltillo.

Specimens examined: Coahuila (*Palmer* 275, type).

Closely related to *H. oxycarpa*. Type in Herb. Gray, J. Donnell-Smith, Canby and Martindale.

The two following species I have not seen, but translate Mr. Bentham's description as given in Gray, Pl. Wright. i. 57. "The first (§ *Gladiata*), including *H. gladiata* and *H. platycarpa*, Herb. coll. Trin. Dubl., with the habit and foliage of *H. stricta*, without black dots on leaves, has the flowers nearly as in *H. Drummondii*, and a straight or slightly curved pod, blunt at apex, with the upper or seminal suture more or less convex, and usually broadest below the middle."

5. *H. gladiata*. Stipules ovate, acute; pinnae 3 to 6 pairs and an odd one; leaflets oblong, nerveless and glandless: calyx acute, hirsute, glandular: petals oblong, with very short stipes; pod lanceolate, slightly incurved, minutely hirsute, and scarcely glandular. (Zimapan, Mexico, *Coulter*.)

6. *H. platycarpa*. Stipules ovate, acute; pinnae 4 to 6 pairs and an odd one; leaflets oblong, nerveless, glandless: calyx acute, hirsute, glandular: petals ovate, scarcely stipitate: pod broadly oblong, pubescent scarcely glandular. (Mexico, *Coulter*.)

++ Vexillum broad, sessile, glandular: style cylindrical: pod lunate (much curved), acute, attenuate below, glabrous: glandular-stipellate.

7. *H. Drummondii* Torr. and Gray, Fl. N. Am. i. 393 (1840). Plants 8 to 10 cm. high, glabrate, glandular, much branched, frutescent from a shrubby base: leaves small (15 to 25 cm. long); pinnae 3 (seldom 5); leaflets 4 to 6 pairs, linear (4 mm. long); stipules small: flowers with conical bases: vexillum red spotted, nearly naked below: filaments with few very short and blunt hairs, the outer glandular: pods 2 cm. long.

Habitat: From Austin to El Paso, Texas.

Specimens examined: Texas (*Wright*, 1849).

The upper stamens are scarcely dilated and with very large stipitate glands.

8. *H. Texensis*. Suffrutescent, scarcely glandular, 20 cm. high, everywhere the grayish bark covered with a fine pubescence: stems intricately branched into many very slender branchlets; leaves many: very small (10 to 18 mm. long); pinnae 3, deciduous; leaflets minute, 3 to 5 pairs; stipules minute, glandular; peduncles 2 to 4 cm. long, slender, with 2 to 5 minute flowers: vexillum with a dense tuft each side of base: stamens glandless, the pubescence rather short, thick, pointed, dense below on upper stamens: style very slender: pod 15 cm. long.

Habitat: Texas, on the Nueces.

Specimens examined: Texas (*Berlandier* 612, type).

Type in Herb. Gray.

This species is most nearly related to *H. Drummondii* in respect to the shape of leaflets, pod, petals, and style; otherwise its gray, pubescent, flexuous branches and branchlets (scarcely larger below than above), its many petioles without pinnae and short branchlets, its very small leaves, leaflets and flowers, its vexillum much tufted at base, and its stamens not glandular but much pubescent, with the upper prominently setose-appendaged, makes this a very distinct species.

--- Vexillum with broad and thick claw, glandless as well as filaments: style very long and cylindrical: pod lunate, with thin, lanceolate, deciduous sepals: stems frutescent, greenish, virgate: leaves small; stipules and bracts lanceolate, caducous.

9. *H. microphylla* Torr. Mex. Bound. 58 (1859). Plant 2 to 12 cm. high, velvety puberulent: pinnae 3, the odd one twice as long and with 7 to 11 pairs of leaflets, the lateral with 5 or 6 pairs; leaflets 3 mm. long, pubescent: racemes many, much elongated, loose, with many flowers (buds blunt): sepals pubescent, the lower much broader, concave: style pubescent, inclined above: pod lunate, both ends acute, upper suture nearly straight, 20 by 7 mm., pubescent, 2 to 6-seeded.

Habitat: From southern California through western Sonora and Lower California.

Specimens examined: California (*Parish Bros.* 591; *S. B. Parish*, 1880; *Vasey*, 1880; *Palmer*, 1870); Sonora (*Pringle*, 1884; *Palmer*); Lower California (*Palmer* 543 in part).

Palmer's pubescent specimens of 543, from Sonora, are smaller in every respect, with fewer flowers, the leaflets often glandular on margin, and the stamens with longer pubescence. It is closely related to the next.

10. *H. glabra*. Glabrous throughout (except margin of stipules and calyx), 45 cm. (or more) high, rigid branched (usually from one side): lateral pinnae 1 cm. long, with 5 pairs of leaflets, the terminal slightly longer and with 6 pairs: racemes slender, 12 to 17 cm. long, bearing 15 to 25 small flowers (buds acute): filaments (upper) with appendage narrow, densely setose on top, projecting at right angles, the pubescence long and slender: style scarcely enlarged or inclined above: pod lunate, 15 by 6 mm., with upper suture curved, acute, base attenuate.

H. microphylla var. *glabra* Watson, Proc. Am. Acad. xxiv. 47.

Habitat: On Los Angeles Bay, Lower California

Specimens examined: Lower California (*Palmer* 543, in part type).

Type in Herb. Gray, J. Donnell-Smith and Canby.

Var. *INTRICATA*. Lower (about 45 cm. high), scarcely erect, with branches and branchlets more spreading, shorter and very rigid: pinnae scarcely as long and with 4 or 5 pairs of leaflets: peduncles many, very short, with few flowers (6 to 8): pod larger (20 by 7 mm.).

H. intricata Brandegee, Proc. Cal. Acad. Sci. 2. ii.

Habitat: At El Campo Aleman, Lower California.

Specimens examined: Lower California (*Brandegee*, 1889, type).

Type in Herb. Gray and National Herbarium.

These two forms are distinct from *H. microphylla* by growing (somewhat) in clumps and being more or less intricately branched (even from below), in the rigidity of the stems, in being entirely glabrous, in the pointed flowering buds, and the strongly attenuate pod.

§ 2. *With both stipitate and black sessile glands: flowers suberect, with ovate bracts and deciduous sepals: stamens somewhat declined: pod broadly ascinateform: suffrutescent.*

11. *H. caudata* Gray, Pl. Lindh. pt. ii. 179 (1850). Stems 30 to 45 cm. high, with small tack-shaped glands: pinnae 3 to 9, 2 to 4 cm. long, with 5 to 7 pairs of leaflets, the terminal one twice as long and with 11 to 15 pairs; leaflets ovate subcordate, veined, sometimes minutely black punctate beneath: racemes sparsely 6 to 9-flowered: sepals oval, concave, with both stipitate and black sessile glands: petals sessile, elliptical, with sessile glands: filaments eglandular with blunt pubescence, the upper not dilated: style cylindrical: pod with upper suture nearly straight, with dark subsessile glands: seeds large.

Habitat: From southern New Mexico (on Rio Grande) through southwestern Texas.

Specimens examined: Texas (*Wright* 146, type; *Schott*, 1854); New Mexico (Mexican Boundary Survey, 279).

Type in Herb. Gray.

This species is related to *Cesalpina* in respect to sepals, petals, and pod.

§ 3. *Parts with black sessile or subsessile glands: leaflets black punctate beneath; stipules setaceous (except No. 12): bracts ovate-attenuate: calyx oblique, with the lower segment much broader, carinate-concave, at last deciduous: petals glandless below, the vexillum smallest: filaments with dense and slender pubescence: style short, enlarged above: stigma turned to the upper side, somewhat hooded: pod with muricate-setose projections and black depressed sessile or subsessile glands, acute, 2 or 3-seeded.*

* *Flowers with black flask-shaped subsessile glands: pod ovate or rhombic.*

12. *H. brachycarpa* Gray, Pl. Wright. i. 55 (1852). Herbaceous, 18 to 30 cm. high, with several slender stems from a ligneous root, few sessile glands, leafy to the top: leaves short; pinnae 5 to 7; leaflets 4 or 5 pairs, elliptical, large-punctate; stipules obovate, caducous: peduncle short, with few small flowers on non-jointed pedicels: sepals and petals with black flask-shaped subsessile glands: pod oval, cuspidate, with few glands, the margin beset with large projections: 2 broadly obovate seeds.

Habitat: From New Mexico through southwestern Texas.

Specimens examined: New Mexico (*Wright* 1023, type in part, 77, type, 179 type); Texas (*Reverchon* 36, 1510); Texas and New Mexico (*Wright*, 1851, type).

Type in Herb. Gray.

The oval pod distinguishes this species from all others.

13. *H. multijuga* Watson Proc. Am. Acad. xxi. 451 (1886). Herbaceous, stout, 60 to 90 cm. high, covered throughout (except leaflets) with flask-shaped subsessile glands: leaves large; pinnae 13 to 21; leaflets 5 to 9 pairs, tipped with a flask-shaped gland: racemes opposite the leaves (longer), many-flowered: pedicels jointed in the middle: vexillum small, with lamina densely covered with black, slender, obelavate glands: pod oblong-rhombic, 3 by 1 cm., cuspidate, 2-seeded.

Habitat: Rocky hills near Chihuahua, Chihuahua.

Specimens examined: Chihuahua (*Pringle* 148 and 371, types).

Types in Herb. Gray, J. Donnell-Smith, Canby, Martindale and Missouri Botanical Garden.

* * *Flowers with pyriform glands, intermixed (on calyx) with few black sessile ones.*

14. *H. melanosticta* Gray, Pl. Wright. i. 54 (1852). Erect, 25 to 60 cm. (or more) high, rigid, frutescent, black sessile glandular, hoary with short villous retrorse hairs: leaves few, 3 to 6 cm. long, very obtuse or retuse, loosely villous as also the rachises: racemes elongated, 15 cm. (or more) long, many-flowered, with pods early deciduous: calyx densely covered with small brown pyriform glands: petals with few villi above on margin and veins, the vexillum densely villous below, with minute pyriform glands above: style with large setose projections and black sessile glands below: pod suberect on straight pedicels, broadly ascinaform, 23 by 9 mm., rounded at base, covered with large projections; seeds usually 3, oblong-obovate, 3 by 5 mm., angular, greenish.

Pomaria melanosticta Schauer, Linnæa, xx. 748.

Habitat: Chisos Mountains, southwest Texas.

Specimens examined. Texas (Nealley 110, 448).

These Nealley specimens correspond mostly with Schauer's description, and differ from the two following forms in the many very small pyriform glands on the vexillum, the broadly ascinaform pod on straight pedicels, and the small angular greenish seeds.

VAR. PARRYI. More slender throughout, not so woody or rigid: leaves spreading, longer; pinnae 3 to 5 (usually 5); leaflets larger, and never more than three pairs: raceme of a few pendent and larger flowers: sepals not so glandular: petals with no villi on margin or veins, and vexillum glandless: ovary long, with sides parallel: pod rhombic (both ends acute), 3 by 1 cm., pendent on curved pedicels: seeds 3 or 4, elliptic-obovate (not angular), 6 by 4 mm., brownish.

Habitat: New Mexico, below San Carlos on the Rio Grande.

Specimens examined. New Mexico (Parry in Mexican Boundary Survey, 283, type).

Type in Herb. Gray.

VAR. GREGGII. Stems branched: pubescence scarcely villous; foliage as in var. *Parryi*, except not so long, and the pinnae with 3 or 4 (usually 3) pairs of leaflets: petals with few and the vexillum with several black depressed sessile glands, with no villi on margin or on veins: style with no projections or glands: stigma short, opening small: pod subclinate, 25 by 6 mm., base usually incurved, pointed: seeds 2 or 3, like var. *Parryi*.

Habitat: Southern Coahuila.

Specimens examined: Coahuila (Gregg 497).

* * * *Flowers (as well as the entire plant) with black depressed sessile glands.*

15. *H. canescens*. Tall, herbaceous (scarcely suffrutescent below), hoary and velvety, with a dense short-villous pubescence: leaves slender (5 to 9 cm. long); pinnae 5 to 9 (usually 7); leaflets 4 to 7 pairs, 5 to 9 mm. long: racemes lateral, loose (dense at first), with 10 to 20 pendent flowers: sepals black with glands: vexillum eglandular, with claw broadly dilated: style with pubescence, glands and setose projections below: pod broadly falcate, 27 by 7 mm., velvety with setose projections: seeds dark, circular or oblong (4 mm. long).

Type in Herb. Gray, and J. Donnell-Smith.

Habitat: Coahuila, near Saltillo.

Specimens examined. Coahuila (Palmer 269, type).

This species is most nearly related to *H. Jamesii*, but very different in being tall and herbaceous: stems not flexuous: hoary and velvety throughout with short-villous (not appressed) pubescence: long and thick peduncles: sepals attenuate-lanceolate, with now and then a flask-shaped gland: vexillum glandless (seldom a gland): style short, with neither membranaceous side nor slit from stigma: pod long, sides parallel, both ends tapering equally, densely covered with glands, pubescence and long setose projections: seeds small.

16. *H. Jamesii* Torr. and Gray, Fl. N. Am. i. 393 (1840). Canescently pubescent, with many suffrutescent stems (20 to 35 cm. high) from a thick ligneous root: leaves many, short; pinnae 5 to 7; leaflets 5 to 10 pairs; racemes lateral, loose, with nodding

flowers: petals glandular; style with pubescence, glands, and short projections below and with the membranaceous portion split from stigma: pod sublunate, 20 by 8 mm., broadest above middle, with very short stellate projections: seeds 2 or 3, oblique, obcordate, 5 to 7 by 4 to 6 mm.

Pomaria glandulosa Torr. Ann. Lye, N. Y. ii. 193, not of Cav.

Habitat: From Colorado and Texas to California.

Specimens examined: Colorado (*Fremont*, 1845; *Green*, 1872; *Parry* 409); New Mexico (*Wright* 1022; *Rothrock* 1874; *Parry* 62; *Fendler* 173, 187; *Wislizenus* 452, 35; *Rusby* 110; *Bigelow*; *Le Roy* Distribution); Texas (*Lindheimer* 603, 286; *Jerny* 730; *Nealley* 320; *Wright* 145; *Reverchon* 7, 161, 803); California (*Thurber* 744).

Type in Herb. Gray.

Var. *POPINOENSIS*. Herbaceous, taller, with thick stems: upper stems and flowers black with large glands; pinnae 7 to 9; leaflets more glandular: racemes denser: petals with villous veins: filaments larger, more villous.

Habitat: Kansas.

Specimens examined. Kansas (*Popinoe*, 1876, type).

Type in National Herbarium.

These forms are characterized mostly by the slit of stigma and the tapering base of the pod.

17. *H. fruticosa* Watson Proc. Am. Acad. xxi. 451 (1886). Chestnut-brown shrub, 120 to 180 cm. high, with branches, foliage, and inflorescence canescent with a fine pubescence: leaves 2 cm. long; pinnae 3 to 5; leaflets 3 or 4 pairs, slightly punctate as also petioles; stipules and bracts laciniate: racemes many, terminal, short (5 to 6 mm. long), with 9 to 12 small flowers: pedicels slender, jointed near the base: sepals costate: vexillum with pyriform glands, the claw broadly dilated: upper filaments with large setose dilations: style short, curved, scarcely enlarged above: pod lunate both ends acute, cinereous with minute projections.

Habitat: Coahuila, mountains near Jimulico.

Specimens examined: Coahuila (*Pringle* 230, type).

Type in Herb. Gray, and J. Donnell-Smith.

SYSTEMATIC AND ALPHABETIC INDEX OF NEW SPECIES OF NORTH AMERICAN PHANEROGAMS AND PTERIDOPHYTES, PUBLISHED IN 1891.*

Compiled by JOSEPHINE A. CLARK.

The increasing interest which is to-day manifested in systematic botany demands some method of indexing which will bring together in convenient form the information necessary to a complete history of the investigations and discoveries which have been made in this line of research. In the Botanical Division of the U. S. Department of Agriculture a carefully made card index is kept, in which all new species and new combinations are recorded. It is thought best to publish this index which has been found so useful in our work, omitting the synonymy and making no attempt to pass judgment upon the value of any species. In other words, it is simply a record of the work accomplished during the year in this line, and designed in printed form to be a convenience to monographers and others in their investigations. To make this list still more useful, in cases of new species, the State or region of the country in which they are found is given. A double enumeration of the species is made, viz, systematic and alphabetic. In the former arrangement Durand's Index Generum Phanerogamorum has been followed for convenience, this being the arrangement adopted in the National Herbarium. In the case of the revival of an old generic name in place of the one now in use the name will be found under the genus, as given in Durand's Index; also when an author has substituted a new generic name for an old one it will be found under the latter. Where a genus has been transferred by an author to a different family from that commonly accepted it will be placed under both families. A new genus has, inclosed in brackets, the number of the genus it naturally follows, with the letter *a* added, the number under which it is found in the National Herbarium.

The author of the species, place of publication, with volume and page, and, as stated above, in cases of new species the locality are given.

* It is our purpose to publish an annual index, and also to complete an index now in preparation, covering preceding years back to 1885. That future issues of the index may be as complete as possible, it is desired that authors will send reprints or reviews to the National Herbarium of such of their publications as may not be readily accessible. The accompanying carefully prepared systematic and alphabetic lists have been made under the immediate direction of my assistant, Mr. J. N. Rose.—GEORGE VASEY, *Botanist*.

As a general rule, a single reference is cited, but exception is made in cases of list names accompanied by sets of plants, and in first publications which are obscure or doubtful; a few names, merely list names, so far as we know, have been included.

Otto Kuntze's *Revisio Geperum Plantarum*, with its thousands of specific changes, has, thus far, been but partially indexed, and is, therefore, passed over for the present, as this list has already been long delayed.

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10. *Ranunculus Grayi* Britton, Bull. Torr. Club, xviii. 265.
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 — *vagans* Watson, Proc. Amer. Acad. xxvi. 131.—Mexico.
21. *Isopyrum trifolium* Britton, Bull. Torr. Club, xviii. 265.
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 749. *Sphæralcea subhastata* Coulter, Contr. Nat. Herb. i. 32.—Texas, New Mexico, and Mexico.
 773. *Chorisia soluta* Donnell-Smith, Bot. Gaz. xvi. 1; Pl. Guat. pt. ii. 7.—Guatemala.
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 828. *Ayenia Jaliscana* Watson, Proc. Amer. Acad. xxvi. 133.—Mexico.
 ——— *paniculata* Rose, Contr. Nat. Herb. i. 94.—Mexico.
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 ——— *rufisepala* Radlkofer in Donnell Smith Pl. Guat. pt. ii, 11 A; in Donnell Smith, Bot. Gaz. xvi. 191.—Guatemala.
 ——— *psilophylla* Radlkofer in Donnell Smith Pl. Guat. pt. ii, 11 A; in Donnell Smith, Bot. Gaz. xvi. 191.—Guatemala.

1370. *Paullinia scarlatina* Radlkofer in Donnell Smith Pl. Guat. pt. ii. 11 A; in Donnell Smith, Bot. Gaz. xvi. 193.—Guatemala.
 ——— *tortuosa* Brandegee, Zoe, ii. 74.
 1315. *Neopringlea integrifolia* Watson, Proc. Amer. Acad. xxvi. 135.

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 1653. *Trifolium amcenum* Greene, Fl. Fran. 27.—California.
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 ——— *variegatum*, var. *melananthum* Greene, Fl. Fran. 29.
 1660. *Lotus Alamosana* Rose, Contr. Nat. Herb. i. 96.—Mexico.
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 ——— *sericea* Trelease in Branner and Coville, Bot. Geol. Surv. Ark. 1888. iv. 174.
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 1667. *Dalea maritima* Brandegee, Proc. Cal. Acad. ser. 2. iii. 125.—Lower California.
 1674. *Brongniartia Palmeri* Rose, Contr. Nat. Herb. i. 97.—Mexico.
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 [1695a]. *Willardia Mexicana* Rose, Contr. Nat. Herb. i. 98.
 1699. *Diphysa racemosa* Rose, Contr. Nat. Herb. i. 97.—Mexico.
 1701. *Coursetia axillaris* Coulter and Rose Bot. Gaz. xvi. 180, 217.; Contr. Nat. Herb. ii. 81.—Texas.
 1720. *Astragalus argillosus* Jones, Zoe, ii. 241.—Utah.
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- 1750.** *Æschynomene vigil* Brandegee, Proc. Cal. Acad. ser. 2. iii. 128.—Lower California.
- 1761.** *Desmodium amans* Watson, Proc. Amer. Acad. xxvi. 135.—Mexico.
 ——— *Jaliscanum* var. *obtusum* Robinson, Proc. Amer. Acad. xxvi. 161.—Mexico.
 ——— *Lindheimeri* Vail, Bull. Torr. Club, xviii. 120.—Texas and Mexico.
 ——— *prostratum* Brandegee, Proc. Cal. Acad. ser. 2. iii. 128.—Lower California.
 ——— *subspicatum* Watson, Proc. Amer. Acad. xxvi. 135.—Mexico.
- 1776.** *Vicia Californica* Greene, Fl. Fran. 3.—California.
 ——— *leucophæa*, var. *mediocincta* Rose, Contr. Nat. Herb. i. 119.
 ——— *linearis* Greene, Fl. Fran. 3.
- 1781.** *Centrosema*.
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- 1784.** *Cologania Jaliscana* Watson, Proc. Amer. Acad. xxvi. 136.
- 1804.** *Galactia discolor* Donnell-Smith, Bot. Gaz. xvi. 194; Pl. Guat. pt. ii. 15.—Guatemala.
- 1813.** *Phaseolus montanus* Brandegee, Proc. Cal. Acad. ser. 2. iii. 130.—Lower California.
- 1848.** *Piscidia mollis* Rose, Contr. Nat. Herb. i. 98.—Mexico.
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- 1849.** *Muelleria*.
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- 1993.** *Desmanthus Cooleyi* Trelease in Branner and Coville, Bot. Geol. Surv. Ark. 1888. iv. 178.
 ——— *fruticosus* Rose in Brandegee, Proc. Cal. Acad. ser. 2. iii. 132.
 ——— *oligospermus* Brandegee, Proc. Cal. Acad. ser. 2. iii. 132.—Lower California.
- 1994.** *Mimosa affinis* Robinson, Bot. Gaz. xvi. 341.—Mexico.
 ——— *Palmeri* Rose, Contr. Nat. Herb. i. 99.—Mexico.
- 1995.** *Schrankia Intsia* Trelease in Branner and Coville, Bot. Geol. Surv. Ark. 1888. iv. 178.
- 1997.** *Acacia filicoides* Trelease in Branner and Coville, Bot. Geol. Surv. Ark. 1888. iv. 178.
- 1998.** *Lysiloma Acapulcensis*, var. *brevispicata* Rose, Contr. Nat. Herb. i. 100.—Mexico.
 ——— *Watsoni* Rose, Contr. Nat. Herb. i. 99.—Mexico.
- 2001.** *Pithecolobium Mexicanum* Rose, Contr. Nat. Herb. i. 100.—Mexico.

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- 2019.** *Prunus ilicifolia* var. *integrifolia* Sudworth, Gard. and For. iv. 51.
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- 2023.** *Nuttallia*.
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- 2024.** *Eriogynia Hendersoni* Canby, Bot. Gaz. xvi. 236.—Washington.
- 2025.** *Spiræa discolor*, var. *ariaefolia* Jack, Gard. and For. iv. 615.
 ——— *rubra* Britton, Bull. Torr. Club, xviii. 270.
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- 2026.** *Neillia*.
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 ——— var. *roribaceus* Bailey, Amer. Gard. xii. 83.—New York.
 ——— *Millspaughi* Britton, Bull. Torr. Club, xviii. 366.—West Virginia.
 ——— *nanus* Watson, Proc. Amer. Acad. xxvi. 162.—Ascension Island.
 ——— *occidentalis*, var. *grandiflora* Focke in Donnell-Smith, Bot. Gaz. xvi. 3.—Guatemala.
 ——— *villosus*, var. *albinus* Bailey, Amer. Gard. xii. 84.—New York.
 ——— *sativus* Bailey, Amer. Gard. xii. 83.—New York.
2047. *Cercocarpus Arizonicus* Jones, Zoe, ii. 14.—Arizona.
 * ——— *parvifolius*, var. *breviflorus* Jones, Zoe, ii. 245.—Utah.
2051. *Geum canadense*, var. *flavum* Britton, Bull. Torr. Club, xviii. 270.
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 ——— *Californica*, var. *elata* Greene, Fl. Fran. 66.
 ——— *Donnell-Smithii* Focke in Donnell-Smith, Bot. Gaz. xvi. 3.—Guatemala.
 ——— *Douglasii*, var. *tenella* Greene, Fl. Fran. 67.
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 ——— *Gordoni*, var. *lycopodioides* Greene, Fl. Fran. 69.
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2062. *Agrimonia parviflora*, var. *macrocarpa* Focke in Donnell-Smith, Bot. Gaz. xvi. 3.—Guatemala.
2069. *Rosa gratissima* Greene, Fl. Fran. 73.—California.
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2074. *Pyrus Ivensis* Bailey, Amer. Gard. xii. 473.—Wisconsin, Illinois, Iowa, and Kansas.
 ——— *Soulardi* Bailey, Amer. Gard. xii. 472.—Minnesota, Missouri, and Texas.
2083. *Amelanchier glabra* Greene, Fl. Fran. 52.—California.
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2095. *Boykinia elata* Greene, Fl. Fran. 190.
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2231. *Callitriche longipedunculata* Morong, Bull. Torr. Club, xviii. 236.—California.

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2370. *Heeria axillaris* Cogniaux in DC. Monogr. Phan. vii. 138.—Mexico and Guatemala.
2371. *Arthrostemma parvifolia* Cogniaux in DC. Monogr. Phan. vii. 143.—Guatemala.

* The use of my name in publishing *Cercocarpus breviflorus* as a variety of *C. parvifolius* was unauthorized, and the combination should be credited to its real publisher, Mr. Jones.—FREDERICK V. COVILLE.

- 2383.** *Tibouchina Bourgaeana* Cogniaux in DC. Monogr. Phan. vii, 264; Bot. Gaz. xvi, 4.—Mexico, Costa Rica, and Guatemala.
- *Ferrariana* Cogniaux in DC. Monogr. Phan. vii, 1176.—Mexico.
- *Galeottiana* Cogniaux in DC. Monogr. Phan. vii, 258.—Mexico.
- *longisepala* Cogniaux in DC. Monogr. Phan. vii, 259.—Guatemala.
- *Mexicana* Cogniaux in DC. Monogr. Phan. vii, 258.—Mexico.
- *monticola* Cogniaux in DC. Monogr. Phan. vii, 263.—Mexico.
- *Naudiniana* Cogniaux in DC. Monogr. Phan. vii, 264.—Mexico.
- *rufipilis* Cogniaux in DC. Monogr. Phan. vii, 259.—Mexico.
- var. *hirsuta* Cogniaux in DC. Monogr. Phan. vii, 259.—Mexico.
- *scabriuscula* Cogniaux in DC. Monogr. Phan. vii, 262.—Mexico.
- *Schiedeana* Cogniaux in DC. Monogr. Phan. vii, 261.—Mexico.
- *Trianaei* Cogniaux in DC. Monogr. Phan. vii, 261.—Mexico.
- 2402.** *Monochætum angustifolium* Cogniaux in DC. Monogr. Phan. vii, 1181.—Mexico.
- *Candollei* Cogniaux in DC. Monogr. Phan. vii, 396.—Mexico.
- *diffusum* Cogniaux in Donnell-Smith, Bot. Gaz. xvi, 4, in DC. Monogr. Phan. vii, 395.—Guatemala.
- 2412.** *Axinæa Costaricensis* Cogniaux in DC. Monogr. Phan. vii, 1182.—Mexico.
- 2454.** *Leandracornoides*, var. *hirtella* Cogniaux in DC. Monogr. Phan. vii, 1189.—Mexico.
- var. *latifolia* Cogniaux in DC. Monogr. Phan. vii, 1189.—Mexico.
- *Costaricensis*, var. *angustifolia* Cogniaux in DC. Monogr. Phan. vii, 1187.—Costa Rica.
- var. *hirsutior* Cogniaux in DC. Monogr. Phan. vii, 1187.—Costa Rica.
- 2459.** *Conostegia Bernoulliana* Cogniaux in DC. Monogr. Phan. vii, 698.—Guatemala and Costa Rica.
- *Cooperi* Cogniaux in DC. Monogr. Phan. vii, 705.—Costa Rica.
- *Donnell-Smithii* Cogniaux in DC. Monogr. Phan. vii, 700.—Costa Rica.
- *hirtella* Cogniaux in Donnell-Smith, Bot. Gaz. xvi, 4; in DC. Monogr. Phan. vii, 711.—Guatemala.
- *lanceolata* Cogniaux in DC. Monogr. Phan. vii, 708.—Costa Rica.
- *Mexicana* Cogniaux in DC. Monogr. Phan. vii, 707.—Mexico.
- *Montelegreana* Cogniaux in DC. Monogr. Phan. vii, 1189.—Costa Rica.
- *puberula* Cogniaux in DC. Monogr. Phan. vii, 703.—Central America.
- 2462.** *Miconia biperulifera* Cogniaux in DC. Monogr. Phan. vii, 911.—Costa Rica.
- *Bourgaeana* Cogniaux in DC. Monogr. Phan. vii, 772.—Mexico.
- *Carioana* Cogniaux in DC. Monogr. Phan. vii, 773.—Guatemala.
- *Costaricensis* Cogniaux in DC. Monogr. Phan. vii, 887.—Costa Rica.
- *glabrata* Cogniaux in DC. Monogr. Phan. vii, 875.—Mexico.
- *Guatemalensis* Cogniaux in Donnell-Smith, Bot. Gaz. xvi, 5; in DC. Monogr. Phan. vii, 758.—Guatemala.
- *humilis* Cogniaux in DC. Monogr. Phan. vii, 764.—Guatemala.
- *Liebmannii* Cogniaux in DC. Monogr. Phan. vii, 821.—Mexico.
- *paleacea* Cogniaux in DC. Monogr. Phan. vii, 757.—Costa Rica.
- *Pittierii* Cogniaux in DC. Monogr. Phan. vii, 1191.—Costa Rica.
- *Schlechtendalii* Cogniaux in DC. Monogr. Phan. vii, 804.—Mexico.
- *Tonduzii* Cogniaux in DC. Monogr. Phan. vii, 1191.—Costa Rica.
- var. *cuneata* Cogniaux in DC. Monogr. Phan. vii, 1191.—Costa Rica.
- var. *furfuracea* Cogniaux in DC. Monogr. Phan. vii, 1191.—Costa Rica.
- var. *latifolia* Cogniaux in DC. Monogr. Phan. vii, 1191.—Costa Rica.

- 2462. *Miconia Tondusii* var. *oblongifolia*** Cogniaux in DC. Monogr. Phan. vii. 1191.—Costa Rica.
 ——— var. *parvifolia* Cogniaux in DC. Monogr. Phan. vii. 1191.—Costa Rica.
 ——— var. *serrulata* Cogniaux in DC. Monogr. Phan. vii. 1191.—Costa Rica.
 ——— ***Tuerckheimii*** Cogniaux in Donnell-Smith, Bot. Gaz. xvi. 5; in DC. Monogr. Phan. vii. 762.—Guatemala.
- 2470. *Clidemia Biolleyana*** Cogniaux in DC. Monogr. Phan. vii. 1193.—Costa Rica.
 ——— ***Donnell-Smithii*** Cogniaux in Donnell-Smith, Bot. Gaz. xvi. 5; in DC. Monogr. Phan. vii. 1018.—Guatemala.
 ——— *laxiflora*, var. *longipetiolata* Cogniaux in Donnell-Smith, Bot. Gaz. xvi. 5; in DC. Monogr. Phan. vii. 991.—Guatemala.
 ——— *Naudiniana* Cogniaux in DC. Monogr. Phan. vii. 990.—Mexico.
- 2478. *Blakea Pittierii*** Cogniaux in DC. Monogr. Phan. vii. 1080.—Costa Rica.
 ——— *subpeltata* Cogniaux in DC. Monogr. Phan. vii. 1075.—Costa Rica.
- 2479. *Topobea Maurofernandeziana*** Cogniaux in DC. Monogr. Phan. vii. 1193.—Costa Rica.
 ——— ***Pittierii*** Cogniaux in DC. Monogr. Phan. vii. 1088.—Costa Rica.
 ——— ***Watsonii*** Cogniaux in DC. Monogr. Phan. vii. 1089.—Guatemala.
- 2484. *Mouriria Muelleri*** Cogniaux in DC. Monogr. Phan. vii. 1118.—Mexico.

LYTHRARIÆ.

- 2488. *Ammannia Kœhnei*** Britton, Bull. Torr. Club, xviii. 271.—New Jersey to Florida.

ONAGRARIÆ.

- 2520. *Epilobium adenocaulon***, var. *occidentalis* Trelease, Rev. Epilob. 95.—Utah, Arizona, etc.
 ——— var. *perplexans* Trelease, Rev. Epilob. 96.—Yellowstone Park, Oregon, California, Colorado, and New Mexico.
 ——— *clavatum* Trelease, Rev. Epilob. 111.—Washington, Oregon, etc.
 ——— *delicatum* Trelease, Rev. Epilob. 98.—Oregon.
 ——— var. *tenue* Trelease, Rev. Epilob. 99.—Oregon.
 ——— *holosericeum* Trelease, Rev. Epilob. 91.—Southern California.
 ——— *leptocarpum*, var. ***Macounii*** Trelease, Rev. Epilob. 103.—Lake Athabasca to Washington.
 ——— *lineare*, var. *oliganthum* Trelease, Rev. Epilob. 88.
 ——— *Oregonense*, var. *gracillimum* Trelease, Rev. Epilob. 109.—California to Washington.
 ——— *paniculatum*, var. *jucundum* Trelease, Rev. Epilob. 85.
 ——— *rigidum*, var. *canescens* Trelease, Rev. Epilob. 83.—Oregon.
 ——— *ursinum* Parish in Trelease, Rev. Epilob. 100.—California to Washington.
 ——— var. *subfalcatum* Trelease, Rev. Epilob. 101.—California and Oregon.
- 2522. *Jussiaea Peruviana***, var. *glaberrima* Donnell-Smith, Bot. Gaz. xvi. 6.—Guatemala.
 ——— *pilosa*, var. *robustior* Donnell-Smith, Bot. Gaz. xvi. 6.—Guatemala.
- 2524. *Ludwigia diffusa*** Greene, Fl. Fran. 227.
 ——— var. ***Californica*** Greene, Fl. Fran. 227.
- 2525. *Clarkia grandiflora*** Greene, Fl. Fran. 223.
- 2526. *Gayophytum lasiospermum*** Greene, Pitt. ii. 164.—Southern California.
- 2528. *Oenothera arguta*** Greene, Fl. Fran. 212.—California.
 ——— *campestris* Greene, Fl. Fran. 216.

2528. *Oenothera compestris* var. *cruciata* Greene, Fl. Fran. 216.
 ——— *decorticans* Greene, Fl. Fran. 217.
 ——— *depressa* Greene, Pitt. ii. 216.—Montana.
 ——— *hirtella* Greene, Fl. Fran. 215.—California.
 ——— *Jepsonii* Greene, Fl. Fran. 211.—California.
 ——— *strigulosa*, var. *epilobioides* Greene, Fl. Fran. 216.—California.
Boisduvallia densiflora, var. *imbricata* Greene, Fl. Fran. 225.—California.
 ——— *stricta* Greene, Fl. Fran. 225.—California.
Godetia pulcherrima Greene, Pitt. ii. 217.—Southern California.

LOASEÆ.

2571. *Mentzelia nitens* Greene, Fl. Fran. 234.—California.

PASSIFLORACEÆ.

2584. *Passiflora allantophylla* Masters in Donnell-Smith, Bot. Gaz. xvi. 7.—Guatemala.
 ——— *clypeophylla* Masters in Donnell-Smith, Bot. Gaz. xvi. 6.—Guatemala.
 ——— *dictiophylla* Masters in Donnell-Smith, Bot. Gaz. xvi. 8.—Guatemala.
 ——— *ornithoura* Masters in Donnell-Smith, Bot. Gaz. xvi. 8.—Guatemala.
 ——— *transversa* Masters in Donnell-Smith, Bot. Gaz. xvi. 7.—Guatemala.

CUCURBITACEÆ.

2647. *Schizocarpum Palmeri* Cogniaux and Rose, Contr. Nat. Herb. i. 100.—Mexico.
 2651. *Melothria Donnell-Smithii* Cogniaux Bot. Gaz. xvi. 9.—Guatemala.
 ——— var. *hirtella* Cogniaux in Donnell-Smith, Bot. Gaz. xvi. 9.—Guatemala.
 ——— var. *rotundifolia* Cogniaux in Donnell-Smith, Bot. Gaz. xvi. 9.—Guatemala.
 2662. *Anguria diversifolia* Cogniaux in Donnell-Smith, Bot. Gaz. xvi. 10.—Guatemala.
 ——— *oblongifolia* Cogniaux in Donnell-Smith, Bot. Gaz. xvi. 9.—Guatemala.
 2663. *Gurania Donnell-Smithii* Cogniaux in Donnell-Smith, Bot. Gaz. xvi. 10.—Guatemala.
 2674. *Echinocystis cirrhopedunculata* Rose, Contr. Nat. Herb. i. 100.—Mexico.
Echinopepon cirrhopedunculata Rose, Contr. Nat. Herb. i. 100.—Mexico.
 2676. *Cyclanthera testudinea* Brandegee, Proc. Cal. Acad. ser. 2. iii. 138.—Lower California.
 [2676 a.] *Vaseyanthus Rosei* Cogniaux, Zoe, i. 368.—Lower California.
 2678. *Sicyos longisepalus* Cogniaux in Donnell-Smith, Bot. Gaz. xvi. 11.—Guatemala.
Micrampelis cirrhopedunculata Rose, Contr. Nat. Herb. i. 100.—Mexico.
 ——— *fabacea*, var. *agrestis* Greene, Fl. Fran. 236.—California.

BEGONIACEÆ.

2695. *Begonia Californica* Brandegee, Proc. Cal. Acad. ser. 2. iii. 140.—Lower California.
 ——— *Pringlei* Watson, Proc. Amer. Acad. xxvi. 136.—Mexico.

CACTEÆ.

2702. *Mamillaria Notesleini* Britton, Bull. Torr. Club, xviii. 350, 367.—Montana.
 ——— *Roseana* Brandegee, Zoe, ii. 19.—Lower California.
 ——— *striatus* Brandegee, Zoe, ii. 19.—Lower California.
 2708. *Cereus Sargentius* Orentt, Gard. and For. iv. 436.
 2714. *Opuntia rotundifolia* Brandegee, Zoe, ii. 21.—Lower California.

FICOIDEÆ.

2730. *Mollugo Cambessidesii* Coulter, Contr. Nat. Herb. ii. 138.

UMBELLIFERÆ.

2758. *Eryngium Mexicanum* Watson, Proc. Amer. Acad. xxvi. 136.—Mexico.
 2763. *Sanicula Canadensis*, var. *Marylandica* Hitchcock, Trans. St. Louis Acad. v. 497.
 2782. *Arracacia Mariana* Watson, Proc. Amer. Acad. xxvi. 136.—Mexico.
 ——— *multifida* Watson, Proc. Amer. Acad. xxvi. 136.—Mexico.
 2814. *Pimpinella Mexicana* Robinson, Proc. Amer. Acad. xxvi. 164.—Mexico.
 2854. *Crantzia*.
Lilæopsis lineata Greene, Pitt. ii. 192.
 2870. *Cymopterus decipiens* Jones, Zoe, ii. 246.—Utah.
 ——— *megacephalus* Jones, Zoe, ii. 14.—Arizona.
 2886. *Peucedanum lapsidosum* Jones, Zoe, ii. 246.—Utah.

ARALIACEÆ.

2962. *Oreopanax oligocarpum* Donnell-Smith, Bot. Gaz. xvi. 194.—Guatemala.

RUBIACEÆ.

3222. *Chomelia Pringlei* Watson, Proc. Amer. Acad. xxvi. 137.—Mexico.
 3286. *Mapouria parviflora* K. Schumann, in Engler u. Prantl, Pflanzenfam. iv. teil, 4 abt. 111.—Mexico and Central America.
 3294. *Uragoga*.
Cephaelis glomerulata Donnell-Smith, Bot. Gaz. xvi. 12.—Guatemala.
 3347. *Crusea megalocarpa* Watson, Proc. Amer. Acad. xxvi. 137.—Mexico.

VALERIANEÆ.

3380. *Plectritis major* Höck in Engler u. Prantl, Pflanzenfam. iv. teil, 3 abt. 177.—California.

COMPOSITÆ.

3405. *Vernonia gigantea* Trelease, in Branner and Coville, Bot. Geol. Surv. Ark. 1888. iv. 189.
 ——— *graminifolia* Trelease, in Branner and Coville, Bot. Geol. Surv. Ark. 1888. iv. 189.
 ——— *marginata* Trelease, in Branner and Coville, Bot. Geol. Surv. Ark. 1888. iv. 189.
 ——— *Palmeri* Rose, Contr. Nat. Herb. i. 101.—Mexico.
 ——— *Salvinæ*, var. *canescans* Coulter, Bot. Gaz. xvi. 95; in Donnell-Smith, Pl. Guat. pt. ii. 33.—Guatemala.
 [3448 a]. *Biolettia riparia* Greene, Pitt. ii. 216.—California.
 3460 *Eupatorium ageratifolium*, var. *purpureum* Coulter, Bot. Gaz. xvi. 98.—Guatemala.
 ——— *Chapalense* Watson, Proc. Amer. Acad. xxvi. 138.—Mexico.
 ——— *Donnell-Smithii* Coulter, Bot. Gaz. xvi. 95; in Donnell-Smith, Pl. Guat. pt. ii. 34.—Guatemala.
 ———, var. *parvifolium* Coulter, Bot. Gaz. xvi. 96; in Donnell-Smith, Pl. Guat. pt. ii. 34.—Guatemala.
 ——— *Espinosaum*, var. *subintegrifolium* Robinson, Proc. Amer. Acad. xxvi. 165.—Mexico.
 ——— *lyratum* Coulter, Bot. Gaz. xvi. 96; in Donnell-Smith, Pl. Guat. pt. ii. 34.—Guatemala.
 ——— *Madrense* Watson, Proc. Amer. Acad. xxvi. 137.—Mexico.
 ——— *Rafaelense* Coulter, Bot. Gaz. xvi. 97; in Donnell-Smith, Pl. Guat. pt. ii. 35.—Guatemala.

- 3465.** *Brickellia Pacayensis* Coulter, Bot. Gaz. xvi. 98; in Donnell-Smith, Pl. Guat. pt. ii. 35.—Guatemala.
- 3468.** *Kuhnia eupatorioides*, var. *glutinosa* Hitchcock, Trans. St. Louis Acad. v. 198.
- 3469.** *Liatris Helleri* Porter, Bull. Torr. Club, xviii. 147.—North Carolina.
- [**3479 a**]. *Golionema heterophylla* Watson, Bot. Gaz. xvi. 267.
Oligonema heterophylla Watson, Proc. Amer. Acad. xxvi. 138.—Mexico.
- 3488.** *Aplopappus stoloniferus*, var. *glabratus* Coulter, Bot. Gaz. xvi. 98; in Donnell-Smith, Pl. Guat. pt. ii. 36.—Guatemala.
- 3491.** *Bigelovia glareosa* Jones, Zoe, ii. 247.—Utah.
- 3493.** *Solidago juncea*, var. *ramosa* Porter and Britton, Bull. Torr. Club, xviii. 368.—Eastern United States.
- 3513.** *Aphanostephus Pinulensis* Coulter, Bot. Gaz. xvi. 98; in Donnell-Smith, Pl. Guat. pt. ii. 35.—Guatemala.
 — *skirrobasis* Trelease, in Branner and Coville, Bot. Geol. Surv. Ark. 1888. iv. 191.
- 3515.** *Achæoteron linearifolius* Watson, Proc. Amer. Acad. xxvi. 139.—Mexico.
- 3537.** *Psilactis tenuis* Watson, Proc. Amer. Acad. xxvi. 139.—Mexico.
- 3544.** *Aster Carnerosanus* Watson, Proc. Amer. Acad. xvi. 139.—Mexico.
 — *Elmeri* Greene, Pitt. ii. 170.—California.
 — *Engelmanni*, var. *paucicapitatus* Robinson, Proc. Amer. Acad. xxvi. 176.—Washington.
 — *Orcuttii* Vasey and Rose, Bot. Gaz. xvi. 113.—California.
 — *venustus* Jones, Zoe, ii. 247.—Utah.
- 3561.** *Erigeron Alamosanum* Rose, Contr. Nat. Herb. i. 102.—Mexico.
 — *aureus* Greene, Pitt. ii. 169.
 — *Californicus* Jepson, Bull. Torr. Club, xvii. 324.—California.
 — *Chihuahuanus* Greene, Pitt. ii. 169.
 — *coronarius* Greene, Pitt. ii. 167.—Mexico.
 — *Forreri* Greene, Pitt. ii. 169.
 — *fraternus* Greene, Pitt. ii. 169.
 — *Galeottii* Greene, Pitt. ii. 168.
 — *multiceps* Greene, Pitt. ii. 167.—California.
 — *Seemannii* Greene, Pitt. ii. 168.
 — *stolonifer* Greene, Pitt. ii. 169.—Colorado.
 — *strigosus* Greene, Pitt. ii. 169.
 — *Wislizeni* Greene, Pitt. ii. 168.
- 3741.** *Clibadium Donnell-Smithii* Coulter, Bot. Gaz. xvi. 98; in Donnell-Smith, Pl. Guat. pt. ii. 37.—Guatemala.
- 3751.** *Melampodium bibracteatum* Watson, Proc. Amer. Acad. xxvi. 140.—Mexico.
 — *glabrum* Watson, Proc. Amer. Acad. xxvi. 139.—Mexico.
 — *sinuatum* Brandegee, Proc. Cal. Acad. ser. 2. iii. 144.—Lower California.
- 3756.** *Berlandiera pumila* Trelease, in Branner and Coville, Bot. Geol. Surv. Ark. 1888. iv. 193.
- 3760.** *Parthenium repens* Eggert, Cat. Pl. St. Louis, 16.
- 3777.** *Zinnia linearis*, var. *latifolia* Rose, Contr. Nat. Herb. i. 102.—Mexico.
- 3797.** *Gymnolomia decumbens* Robinson, Proc. Amer. Acad. xxvi. 165.—Mexico.
- 3798.** *Sclerocarpus spatulatus* Rose, Contr. Nat. Herb. i. 103.—Mexico.
- 3804.** *Tetragonotheca Guatemalensis* Coulter, Bot. Gaz. xvi. 99; in Donnell-Smith, Pl. Guat. pt. ii. 38.—Guatemala.
- 3819.** *Zexmenia dulcis* Coulter, Bot. Gaz. xvi. 99; in Donnell-Smith, Pl. Guat. pt. ii. 38.—Guatemala.
 — *fruticosa* Rose, Contr. Nat. Herb. i. 103.—Mexico.
- 3822.** *Tithonia fruticosa* Canby and Rose, Contr. Nat. Herb. i. 104.—Mexico.
 — *macrophylla* Watson, Proc. Amer. Acad. xxvi. 140.—Mexico.
 — *Palmeri* Rose, Contr. Nat. Herb. i. 104.—Mexico.

- 3823.** *Viguiera leptocaulis* Watson, Proc. Amer. Acad. xxvi. 140.—Mexico.
 ——— *montana* Rose, Contr. Nat. Herb. i. 103.—Mexico.
- 3829.** *Encelia nutans* Eastwood, Zoe, ii. 230.—Colorado.
- 3832.** *Verbesina erosa* Brandegee, Proc. Cal. Acad. ser. 2. iii. 146.—Lower California.
 ——— *scaposa* Jones, Zoe, ii. 248.—Utah.
- 3833.** *Otopappus acuminatus* Watson, Proc. Amer. Acad. xxvi. 140.—Mexico.
 ——— *alternifolius* Robinson, Proc. Amer. Acad. xxvi. 165.—Mexico.
- 3835.** *Spilanthes Botteri* Watson, Proc. Amer. Acad. xxvi. 141.—Mexico.
- 3836.** *Salmea Palmeri* Watson, Proc. Amer. Acad. xxvi. 141.—Mexico.
- 3852.** *Dahlia dissecta* Watson, Proc. Amer. Acad. xxvi. 141.—Mexico.
 ——— *pubescens* Watson, Proc. Amer. Acad. xxvi. 142.—Mexico.
- 3856.** *Bidens Alamosana* Rose, Contr. Nat. Herb. i. 104.—Mexico.
 ——— *Antiguensis* Coulter, Bot. Gaz. xvi. 100; in Donnell-Smith, Pl. Guat. pt. ii. 40.—Guatemala.
 ——— *dahlioides* Watson, Proc. Amer. Acad. xxvi. 142.—Mexico.
- 3864.** *Marshallia trinervia* Trelease in Branner and Coville, Bot. Geol. Surv. Ark. 1888. iv. 196.
- 3870.** *Madia hispida* Greene, Pitt. ii. 217.
- 3884.** *Laphamia Gilensis* Jones, Zoe, ii. 15.—Arizona.
- 3885.** *Perityle crassifolia* Brandegee, Proc. Cal. Acad. ser. 2. iii. 147.—Lower California.
 ——— *effusa* Rose, Contr. Nat. Herb. i. 104.—Mexico.
 ——— *minutissima* Rose in Brandegee, Proc. Cal. Acad. ser. 2. iii. 148.—Lower California.
- 3896.** *Riddellia*.
Psilostrophe Cooperi Greene, Pitt. ii. 176.
 ——— *tagetina* Greene, Pitt. ii. 176.
 ——— var. *sparsiflora* Greene, Pitt. ii. 176.
- 3898.** *Chænactis scaposa* Eastwood, Zoe, ii. 231.—Colorado.
- 3899.** *Hymenopappus radiata* Rose, Contr. Nat. Herb. i. 122.—Arizona.
- 3901.** *Bahia desertorum* Jones, Zoe, ii. 249.—Utah.
 ——— *Schaffneri* Watson, Proc. Amer. Acad. xxvi. 142.—Mexico.
Eriophyllum Jepsonii Greene, Pitt. ii. 165.—California.
- 3909.** *Palafoxia*.
Polypteris sphacelata Trelease in Branner and Coville, Bot. Geol. Surv. Ark. 1888. iv. 197.
- 3923.** *Dysodia papposa* Hitchcock, Trans. St. Louis Acad. v. 503.
- 3926.** *Hymenatherum anomalum* Canby and Rose in Rose, Contr. Nat. Herb. i. 105.—Mexico.
- 3936.** *Actinella Texana* Coulter and Rose, Bot. Gaz. xvi. 27.—Texas.
- 3996.** *Luina Piperi* Robinson, Bot. Gaz. xvi. 43.—Washington.
- 4025.** *Senecio Cobanensis* Coulter in Donnell-Smith, Pl. Guat. pt. ii. 42; Bot. Gaz. xvi. 101.—Guatemala.
 ——— *Donnell-Smithii* Coulter in Donnell-Smith, Pl. Guat. pt. ii. 42; Bot. Gaz. xvi. 100.—Guatemala.
 ——— *Ghiesbreghtii*, var. *paniculatus* Coulter in Donnell-Smith, Pl. Guat. pt. ii. 42, 43; Bot. Gaz. xvi. 101.—Guatemala.
 ——— *Guadalajarensis* Robinson, Proc. Amer. Acad. xxvi. 166.—Mexico.
 ——— *Hesperius* Greene, Pitt. ii. 166.—Oregon.
 ——— *Jaliscana* Watson, Proc. Amer. Acad. xxvi. 143.—Mexico.
 ——— *Rawsonianus* Greene, Pitt. ii. 166.—California.
Cacalia poculifera Watson, Proc. Amer. Acad. xxvi. 143.—Mexico.
- 4078.** *Cnicus linearifolius* Watson, Proc. Amer. Acad. xxvi. 143.—Mexico.
 ——— *velatus* Watson, Proc. Amer. Acad. xxvi. 143.—Mexico.

- 4154. *Perezia collina*** Watson, Proc. Amer. Acad. xxvi. 144.—Mexico.
 ——— *montana* Rose, Contr. Nat. Herb. i. 105.—Mexico.
- 4199. *Troximon*.**
Agoseris alpestris Greene, Pitt. ii. 177.
 ——— *apargioides* Greene, Pitt. ii. 177.
 ——— *Arizonica* Greene, Pitt. ii. 176.
 ——— *aurantiaca* Greene, Pitt. ii. 177.
 ——— *barbellulata* Greene, Pitt. ii. 177.
 ——— *Chilensis* Greene, Pitt. ii. 178.
 ——— *elata* Greene, Pitt. ii. 177.
 ——— *glauca* Greene, Pitt. ii. 176.
 ——— *gracilentata* Greene, Pitt. ii. 177.
 ——— var. *Greenei* Greene, Pitt. ii. 177.
 ——— *grandiflora* Greene, Pitt. ii. 178.
 ——— *heterophylla* Greene, Pitt. ii. 178.
 ——— *hirsuta* Greene, Pitt. ii. 177.
 ——— *laciniata* Greene, Pitt. ii. 178.
 ——— *lævigata* Greene, Pitt. ii. 178.
 ——— *major* Jepson, Pitt. ii. 179; Bull. Torr Club, xviii. 325.
 ——— *Marshallii* Greene, Pitt. ii. 178.
 ——— *parviflora* Greene, Pitt. ii. 176.
 ——— *plebeia* Greene, Pitt. ii. 178.
 ——— *Pœppigii* Greene, Pitt. ii. 178.
 ——— *purpurea* Greene, Pitt. ii. 177.
 ——— *retrorsa* Greene, Pitt. ii. 178.
 ——— *rosea* Greene, Pitt. ii. 176.
 ——— *scorzoneræfolia* Greene, Pitt. ii. 177.
- 4202. *Pyrhopappus*.**
Sitilias grandiflora Greene, Pitt. ii. 180.
 ——— *multicaulis* Greene, Pitt. ii. 179.
 ——— *pauciflora* Greene, Pitt. ii. 180.
 ——— *Rothrockii* Greene, Pitt. ii. 180.
 ——— *Sesseana* Greene, Pitt. ii. 180.
- 4206. *Lactuca spicata*** Hitchcock, Trans. St. Louis Acad. v. 506.
- 4224. *Rafinesquia*.**
Nemoseris Californica Greene, Pitt. ii. 193.
 ——— *Neo-Mexicana* Greene, Pitt. ii. 193.

LOBELIACEÆ.

- 4253. *Laurentia Michoacana***, var. *ovatifolia* Robinson in Pringle, Pl. Mex. 1890; Proc. Amer. Acad. xxvi. 167.—Mexico.
 ——— *ovatifolia* Robinson, Proc. Amer. Acad. xxvi. 166.—Mexico.
- 4262. *Lobelia laxiflora***, var. *insignis* Donnell-Smith, Bot. Gaz. xvi. 12.—Guatemala.
 ——— *novella* Robinson, Proc. Amer. Acad. xxvi. 167.—Mexico.
- 4264. *Heterotoma aurita*** Brandegee, Proc. Cal. Acad. ser. 2. iii. 149.—Lower California.
- 4268. *Nemacladus oppositifolius*** Robinson, Proc. Amer. Acad. xxvi. 168.—Mexico.

VACCINIACEÆ.

- 4302. *Macleania cordata***, var. *linearifolia* Donnell-Smith, Bot. Gaz. xvi. 12.—Guatemala.

ERICACEÆ.

4330. *Arctostaphylos media* Greene, Pitt. ii. 171.—Washington.
 ——— *patula* Greene, Pitt. ii. 171.—California.
 ——— *pungens*, var. *cratericola* Donnell-Smith, Bot. Gaz. xvi. 13.—Guatemala.
 4375. *Rhododendron Sonomense* Greene, Pitt. ii. 172.—California.

PRIMULACEÆ.

4449. *Steironema quadriflorum* Hitchcock, Trans. St. Louis Acad. v. 506.
 4457. *Samolus Valerandi*, var. *repens* Brandegee, Proc. Cal. Acad. ser. 2. iii. 150.—Lower California.

MYRSINEÆ.

4469. *Parathesis pleurobotryosa* Donnell-Smith, Bot. Gaz. xvi. 195.—Guatemala.
 ——— *sessilifolia* Donnell-Smith, Pl. Guat. pt. ii. 45; Bot. Gaz. xvi. 195.—Guatemala.

SAPOTACEÆ.

4508. *Mimusops Floridana* Engler in Engler u. Prantl, Pflanzenfam. iv. teil, 1 abt. 152.—Florida.

STYRACEÆ.

4527. *Symplocos Benthani* Gürke in Engler u. Prantl, Pflanzenfam. iv. teil, 1 abt. 172.—Mexico.
 ——— *Pringlei* Robinson, Proc. Amer. Acad. xxvi. 168.—Mexico.
 4529. *Styrax Jaliscana* Watson, Proc. Amer. Acad. xxvi. 144.—Mexico.

OLEACEÆ.

4540. *Fraxinus viridis*, var. *pubescens* Hitchcock, Trans. St. Louis Acad. v. 507.

ASCLEPIADEÆ.

4739. *Gomphocarpus*.
Acerates Floridana Hitchcock, Trans. St. Louis Acad. v. 508.
 4740. *Schizonotus arizæfolius* Greene, Fl. Fran. 58.
 4745. *Metastelma latifolia* Rose, Contr. Nat. Herb. i. 106.—Mexico.
 4801. *Gonolobus parviflorus*, var. *brevicoronatus* Robinson, Proc. Amer. Acad. xxvi. 169.—Texas.
 4819. *Frimbristemma calycosa* Donnell-Smith, Pl. Guat. pt. ii. 48; Bot. Gaz. xvi. 196.—Guatemala.
 4831. *Nephradenia fruticosa* Donnell-Smith, Pl. Guat. pt. ii. 48; Bot. Gaz. xvi. 196.—Guatemala.

LOGANIACEÆ.

4898. *Buddleia Chapalana* Robinson, Proc. Amer. Acad. xxvi. 169.—Mexico.
 ——— *Wrightii* Robinson, Bot. Gaz. xvi. 341.—Mexico.

GENTIANÆ.

4937. *Erythræa Pringleana* Wittrock, Bot. Gaz. xvi. 85.—Mexico.
 4939. *Sabbatia dichotoma* Trelease in Branner and Coville, Bot. Geol. Surv. Ark. 1888, iv. 204.
 4945. *Schultesia Mexicana* Watson, Proc. Amer. Acad. xxvi. 144.—Mexico.
 4955. *Gentiana quinquefolia*, var. *occidentalis* Hitchcock, Trans. St. Louis Acad. v. 508.
 4959. *Frasera Utahensis* Jones, Zoc. ii. 13.—Utah.

POLEMONIACEÆ.

4968. *Collomia Pringlei* Peter in Engler u. Prantl, Pflanzenfam. iv. teil, 3 abt. a. 48.
 4969. *Gilia Howardi* Jones, Zoe, ii. 250.—Utah.

HYDROPHYLLACEÆ.

4978. *Phacelia dubia* Trelease in Branner and Coville, Bot. Geol. Surv. Ark. 1888 iv. 205.
 ——— var. *hirsuta* Trelease in Branner and Coville, Bot. Geol. Surv. Ark. 1888. iv. 205.
 ——— *Eisenii* Brandegee, Zoe, ii. 252.—California.

BORAGINÆÆ.

4992. *Cordia Pringlei* Robinson, Proc. Amer. Acad. xxvi. 169.—Mexico.
 ——— *Sonoræ* Rose, Contr. Nat. Herb. i. 106.—Mexico.
 4998. *Ehretia Mexicana* Watson, Proc. Amer. Acad. xxvi. 144.—Mexico.
 5006. *Heliotropium Pringlei* Robinson, Proc. Amer. Acad. xxvi. 170.—Mexico.
 5016. *Omphalodes acuminata* Robinson, Proc. Amer. Acad. xxvi. 170.—Mexico.
 5026. *Echinosperrum*.
 Lappula ciliata Greene, Pitt. ii. 182.
 —— *deflexa* Greene, Pitt. ii. 182.
 —— *diffusa* Greene, Pitt. ii. 182.
 —— *floribunda* Greene, Pitt. ii. 182.
 —— *hispida* Greene, Pitt. ii. 182.
 —— *Mexicana* Greene, Pitt. ii. 182.
 —— *nervosa* Greene, Pitt. ii. 182.
 —— *pinetorum* Greene, Pitt. ii. 182.
 —— *Redowskii* Greene, Pitt. ii. 182.
 —— *ursina* Greene, Pitt. ii. 182.
 —— *Virginiana* Greene, Pitt. ii. 182.
 5027. *Eritrichium*.
 Krynitzkia glomerata, var. *acuta* Jones, Zoe, ii. 250.—Utah.

CONVOLVULACEÆ.

5077. *Ipomœa alata* Rose, Contr. Nat. Herb. i. 108.—Mexico.
 ——— *Bernouilliana* Peter in Engler u. Prantl, Pflanzenfam. iv. teil, 3 abt. a. 30.—Guatemala.
 ——— *brevipes* Peter in Engler u. Prantl, Pflanzenfam. iv. teil, 3 abt. a. 30.—Guatemala.
 ——— *Grayi* Rose, Contr. Nat. Herb. i. 107.—Mexico.
 ——— *Leonensis* Robinson, Proc. Amer. Acad. xxvi. 170.—Mexico.
 ——— *macrantha* Peter in Engler u. Prantl, Pflanzenfam. iv. teil, 3 abt. a. 31.—Guatemala.
 ——— *nuda* Peter in Engler u. Prantl, Pflanzenfam. iv. teil, 3 abt. a. 31.—Guatemala.
 ——— *rostrata* Peter in Engler u. Prantl, Pflanzenfam. iv. teil, 3 abt. a. 30.—Guatemala.
 ——— *Schrenkiana* Peter in Engler u. Prantl, Pflanzenfam. iv. teil, 3 abt. a. 30.—New York.
 ——— *sericophylla* Peter in Engler u. Prantl, Pflanzenfam. iv. teil, 3 abt. a. 31.—Guatemala.
 ——— *Tortugensis* Peter in Engler u. Prantl, Pflanzenfam. iv. teil, 3 abt. 31.—Guatemala.
 5088. *Breweria tenella* Peter in Engler u. Prantl, Pflanzenfam. iv. teil. 3 abt. 16.
 5106. *Solanum Donnell-Smithii* Coulter in Donnell-Smith, Pl. Guat. pt. ii. 51; Bot. Gaz. xvi. 144.—Guatemala.
 ——— *Grayi* Rose, Contr. Nat. Herb. i. 108.—Mexico.

- 5113. *Bassovia Donnell-Smithii*** Coulter in Donnell-Smith, Pl. Guat. pt. ii. 53; Bot. Gaz. xvi. 145.—Guatemala.
 ——— **Mexicana** Robinson in Donnell-Smith, Pl. Gaut. pt. ii. 53; Proc. Amer. Acad. xxvi. 171.—Guatemala.
 ——— var. **latifolia** Coulter and Robinson in Donnell-Smith, Pl. Guat. pt. ii. 53; Bot. Gaz. xvi. 145.—Guatemala.
5115. *Brachistus Escuintlensis* Coulter in Donnell-Smith, Pl. Guat. pt. ii. 53; Bot. Gaz. xvi. 144.—Guatemala.
5119. *Withania melanocystis* Robinson, Proc. Amer. Acad. xxvi. 171.—Mexico.

SCROPHULARINEÆ.

- 5215. *Pentstemon Haydeni*** Watson, Bot. Gaz. xvi. 311.—Nebraska.
 ——— **Sonomensis** Greene, Pitt. ii. 218.—California.
5216. *Russelia coccinea* Wettstein in Engler u. Prantl, Pflanzenfam. iv. teil, 3 abt. b. 63.
5239. *Mimulus Condonii* Robinson, Proc. Amer. Acad. xxvi. 175.—California.
 ——— **filicaulis** Watson, Proc. Amer. Acad. xxvi. 125.—California.
 ——— **gracilipes** Robinson, Proc. Amer. Acad. xxvi. 176.—California.
5253. *Herpestiis acuminata* Trelease in Branner and Coville, Bot. Geol. Surv. Ark. 1888. iv. 208.
 ——— **auriculata** Robinson, Proc. Amer. Acad. xxvi. 172.—Mexico.
5255. *Bacopa amplexicaulis* Wettstein, in Engler u. Prantl, Pflanzenfam. iv. teil, 3 abt. b. 77.
 ——— **repens** Wettstein in Engler u. Prantl, Pflanzenfam. iv. teil, 3 abt. b. 76.
 ——— **rotundifolia** Wettstein in Engler u. Prantl, Pflanzenfam. iv. teil, 3 abt. b. 76.
5267. *Micranthemum mircranthemoides* Wettstein in Engler u. Prantl, Pflanzenfam. iv. teil, 3 abt. b. 77.
5318. *Gerardia punctata* Robinson, Proc. Amer. Acad. xxvi. 172.—Mexico.
5321. *Castilleia marcrostigma* Robinson, Proc. Amer. Acad. xxvi. 173.—Mexico.
5324. *Cordylanthus*.
 Adenostegia canescens Greene, Pitt. ii. 181.
 ——— **capitata** Greene, Pitt. ii. 180.
 ——— **Kingii** Greene, Pitt. ii. 181.
 ——— **laxiflora** Greene, Pitt. ii. 181.
 ——— **maritima** Greene, Pitt. ii. 181.
 ——— **mollis** Greene, Pitt. ii. 181.
 ——— **Nevinii** Greene, Pitt. ii. 181.
 ——— **Orcuttiana** Greene, Pitt. ii. 181.
 ——— **Parryi** Greene, Pitt. ii. 181.
 ——— **pilosa** Greene, Pitt. ii. 180.
 ——— var. **Bolanderi** Greene, Pitt. ii. 180.
 ——— **Pringlei** Greene, Pitt. ii. 181.
 ——— **ramosa** Greene, Pitt. ii. 180.
 ——— **rigida**, var. **brevibracteata** Greene, Pitt. ii. 180.
 ——— **tenuis** Greene, Pitt. ii. 180.
 ——— **Wrightii** Greene, Pitt. ii. 180.

GESNERACEÆ.

- 5380. *Solenophora erubescens*** Donnell-Smith, Pl. Guat. pt. ii. 56; Bot. Gaz. xvi. 197.—Guatemala.
5438. *Besleria Pansamalana* Donnell-Smith, Pl. Guat. pt. ii. 56; Bot. Gaz. xvi. 197.—Guatemala.
5447. *Macfadyena simplicifolia* Donnell-Smith, Bot. Gaz. xvi. 198.—Guatemala.
5467. *Tabebuia Palmeri* Rose, Contr. Nat. Herb. i. 109.—Mexico.

ACANTHACEÆ.

- 5512.** *Mendoncia cleistophylla* Donnell-Smith, Pl. Guat. pt. ii. 57.
5611. *Justicia Pringlei* Robinson, Proc. Amer. Acad. xxvi. 173.—Mexico.
5621. *Dianthera ovata* Trelease in Branner and Coville, Bot. Geol. Surv. Ark. 1888. iv. 210.
5623. *Carlowrightia fimbriata* Brandegee, Proc. Amer. Acad. ser. 2. iii. 161.—Lower California.
 ——— *pectinata* Brandegee, Proc. Cal. Acad. ser. 2. iii. 160.—Lower California.
5640. *Didiplera formosa* Brandegee, Proc. Cal. Acad. ser. 2. iii. 162.—Lower California.
5641. *Tetramerium*.
Henrya imbricans Donnell-Smith, Pl. Guat. pt. ii. 59; Bot. Gaz. xvi. 198.—Guatemala.

VERBENACEÆ.

- 5680.** *Lippia formosa* Brandegee, Proc. Cal. Acad. ser. 2. iii. 163.—Lower California.
 ——— *montana* Brandegee, Proc. Cal. Acad. ser. 2. iii. 163.—Lower California.
5694. *Citharexylum Berlandieri* Robinson, Proc. Amer. Acad. xxvi. 174.—Mexico.
 ——— *Cinaloanum* Robinson, Bot. Gaz. xvi. 342.—Mexico.

LABIATÆ.

- 5744.** *Hyptis collina* Brandegee, Proc. Cal. Acad. ser. 2. iii. 164.—Lower California.
5780. *Calamintha glabra* Trelease in Branner and Coville, Bot. Geol. Surv. Ark. 1888. iv. 211.
5793. *Salvia Alamosana* Rose, Contr. Nat. Herb. i. 110.—Mexico.
5810. *Scutellaria hispidula* Robinson, Proc. Amer. Acad. xxvi. 174.—Mexico.
5829. *Stachys aspera*, var. *tenuiflora* Hitchcock, Trans. St. Louis. Acad. v. 513.

NYCTAGINEÆ.

- 5870.** *Mirabilis exserta* Brandegee, Proc. Cal. Acad. ser. 2. iii. 165.
5874. *Boerhaavia Alamosana* Rose, Contr. Nat. Herb. i. 110.—Mexico.
 ——— *octandra* Watson, Proc. Amer. Acad. xxvi. 145.—Mexico.
 ——— *Sonoræ* Rose, Contr. Nat. Herb. i. 111.—Mexico.
5886. *Pisonia aculeata*, var. *macranthocarpa* Donnell-Smith, Bot. Gaz. xvi. 198.—Guatemala.
5889. *Neea psychotrioides* Donnell-Smith, Pl. Guat. pt. ii. 63; Bot. Gaz. xvi. 199.—Guatemala.

ILLECEBRACEÆ.

- 5901.** *Paronychia monandra* Brandegee, Proc. Cal. Acad. ser. 2. iii. 115.—Lower California.

AMARANTACEÆ.

- 5952.** *Cladotrix cryptantha* Watson, Proc. Amer. Acad. xxvi. 125.—California.

CHENOPODIACEÆ.

- 5971.** *Monolepis Nuttalliana* Greene, Fl. Fran. 168.
5979. *Atriplex corrugata* Watson, Bot. Gaz. xvi. 345.—Colorado.
6014. *Salicornia occidentalis* Greene, Fl. Fran. 173.

POLYGONACEÆ.

6070. *Eriogonum agninum* Greene, Pitt. ii. 165.—Southern California.
 ——— *dasyanthemum*, var. *Jepsonii* Greene, Fl. Fran. 150.—California.
 ——— *deserticola* Watson, Proc. Amer. Acad. xxvi. 125.—Southern California.
 ——— *elegans* Greene, Pitt. ii. 173.—California.
 ——— *flexum* Jones, Zoe, ii. 15.—Arizona.
 ——— *minutiflorum* Watson, Proc. Amer. Acad. xxvi. 125.—Southern California.
 ——— *Nortoni* Greene, Pitt. ii. 165.—California.
 ——— *vimineum*, var. *caninum* Greene, Fl. Fran. 150.—California.
 6071. *Oxytheca hirtiflora* Greene, Fl. Fran. 153.
 ——— *spergulina* Greene, Fl. Fran. 153.
 6072. *Chorizanthe Nortoni* Greene, Pitt. ii. 164.—California.
 6084. *Polygonum Kelloggii* Greene, Fl. Fran. 134.—California.

CYTINACEÆ.

6125. *Apodanthes globosa* Watson in Robinson, Bot. Gaz. xvi. 83.—Mexico.
 ——— *Pringlei* Watson in Robinson, Bot. Gaz. xvi. 83.—Mexico.

ARISTOLOCHIEÆ.

6135. *Aristolochia nana* Watson, Proc. Amer. Acad. xxvi. 145.—Mexico.

PIPEREÆ.

6141. *Piper Donnell-Smithii* C. DC. in Donnell-Smith, Pl. Guat. pt. ii. 95.—Guatemala.
 ——— *Jaliscanum* Watson, Proc. Amer. Acad. xxvi. 145.—Mexico.
 ——— *santa-rosanum* C. DC. in Donnell-Smith, Pl. Guat. pt. ii. 96.—Guatemala.
 ——— *Tuerckheimii* C. DC. in Donnell-Smith, Pl. Guat. pt. ii. 96.—Guatemala.
 ——— *Yzabalamum* C. DC. in Donnell-Smith, Pl. Guat. pt. ii. 66.—Guatemala.
 6145. *Peperomia albidiflora* C. DC. in Donnell-Smith, Pl. Guat. pt. ii. 66.—Guatemala.
 ——— *Cobana* C. DC. in Donnell-Smith, Pl. Guat. pt. ii. 66.—Guatemala.
 ——— *Jaliscana* Watson, Proc. Amer. Acad. xxvi. 145.—Mexico.
 ——— *Tuerckheimii* C. DC. in Donnell-Smith, Pl. Guat. pt. ii. 96.—Guatemala.

LAURINEÆ.

6195. *Persea Donnell-Smithii* Mez in Donnell-Smith, Pl. Guat. pt. ii. 67.—Guatemala.

THYMELÆACEÆ.

6275. *Daphnopsis Tuerckheimiana* Donnell-Smith, Bot. Gaz. xvi. 13; Pl. Guat. pt. ii. 68.—Guatemala.

EUPHORBIACEÆ.

6370. *Euphorbia biserrata* Millspaugh, Zoe, i. 347.—California.
 ——— *digitata* Watson, Proc. Amer. Acad. xxvi. 146.—Mexico.
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- 6370. *Euphorbia incerta*** Brandegee, Proc. Amer. Acad. ser. 2. iii. 171.—Lower California.
 ——— *misella* Watson, Proc. Amer. Acad. xxvi. 146.—Mexico.
 ——— *rugulosa* Greene, Fl. Fran. 92.
 ——— *tuberosa* Rose, Contr. Nat. Herb. i. 111.—Mexico.
 ——— *subpeltata* Watson, Proc. Amer. Acad. xxvi. 146.—Mexico.
 ——— *Watsonii* Millspaugh, Zoe, i. 347.—California.
- 6404. *Phyllanthus Pringlei*** Watson, Proc. Amer. Acad. xxvi. 147.—Mexico.
[6455a]. *Zimapania Schiedeana* Engler and Pax in Engler u. Prantl, Pflanzenfam. iii. teil, 5 abt. 119.—Mexico.
- 6460. *Croton Alamosanum*** Rose, Contr. Nat. Herb. i. 111.—Mexico.
 ——— *calvescens* Watson, Proc. Amer. Acad. xxvi. 147.—Mexico.
 ——— *elæagnoides* Watson, Proc. Amer. Acad. xxvi. 147.—Mexico.
- 6488. *Manihot Pringlei*** Watson, Proc. Amer. Acad. xxvi. 148.—Mexico.
- 6502. *Acalypha aliena*** Brandegee, Proc. Cal. Acad. ser. 2. iii.—Lower California.
 ——— *dissitifolia* Watson, Proc. Amer. Acad. xxvi. 148.—Mexico.
 ——— *flavescens* Watson, Proc. Amer. Acad. xxvi. 149.—Mexico.
 ——— *longipes* Watson, Proc. Amer. Acad. xxvi. 149.—Mexico.
 ——— *multispicata* Watson, Proc. Amer. Acad. xxvi. 148.—Mexico.
- 6555. *Dalechampia scandens*, var. *trisecta*** Donnell-Smith, Bot. Gaz. xvi. 199.—Guatemala.
- 6570. *Sabastiana Palmeri*** Rose, Contr. Nat. Herb. i. 112.—Mexico.
 ——— *Pringlei* Watson, Proc. Amer. Acad. xxvi. 149.—Mexico.
- 6572. *Gymnanthes Pringlei*** Watson in Pringle, Pl. Mex. 1890.—Mexico.

URTICACEÆ.

- 6621. *Ficus Guadalajarana*** Watson, Proc. Amer. Acad. xxvi. 151.—Mexico.
 ——— *Jaliscana* Watson, Proc. Amer. Acad. xxvi. 150.—Mexico.
 ——— *Pringlei* Watson, Proc. Amer. Acad. xxvi. 150.—Mexico.
 ——— *radulina* Watson, Proc. Amer. Acad. xxvi. 151.—Mexico.
- 6661. *Pilea glabra*** Watson, Proc. Amer. Acad. xxvi. 152.—Mexico.
- 6681. *Myriocarpa brachystachys*** Watson, Proc. Amer. Acad. xxvi. 152.—Mexico.
 ——— *longipes*, var. *Yzabalensis* Donnell-Smith, Bot. Gaz. xvi. 13.—Guatemala.

JUGLANDEÆ.

- 6695. *Carya Fernowiana*** Sudworth, Trees of Washington, D. C. [6].—In cultivation.
Hicoria Fernowiana Sudworth, Trees of Washington, D. C. [6].—In cultivation.
- 6696. *Juglans Mexicana*** Watson, Proc. Amer. Acad. xxvi. 152.—Mexico.

CUPULIFERÆ.

- 6710. *Castanea Castanea*, var. *Americana*** Sudworth, Trees of Washington, D. C. [7].—In cultivation.

SALICINEÆ.

- 6712. *Salix Brownii*, var. *petræa*** Bebb, Bot. Gaz. xvi. 107.—California.
 ——— *macrocarpa*, var. *argentea* Bebb, Bot. Gaz. xvi. 105.—California.

ORCHIDEÆ.

- 6754. *Microstylis tenuis*** Watson, Proc. Amer. Acad. xxvi. 152.—Mexico.
Achroanthes corymbosa Greene, Pitt. ii. 184.
 ——— *Floridana* Greene, Pitt. ii. 183.

652. *Achroanthes maianthemifolia* Greene, Pitt. ii. 184.
 ——— *monophylla* Greene, Pitt. ii. 183.
 ——— *montana* Greene, Pitt. ii. 183.
 ——— *ochreatea* Greene, Pitt. ii. 184.
 ——— *Pringlei* Greene, Pitt. ii. 184.
 ——— *purpurea* Greene, Pitt. ii. 184.
 ——— *umbellulata* Greene, Pitt. ii. 184.
 6787. *Bletia Palmeri* Watson, Proc. Amer. Acad. xxvi. 153.—Mexico.
 6849. *Govenia elliptica* Watson, Proc. Amer. Acad. xxvi. 153.—Mexico.
 6992. *Spiranthes Jaliscana* Watson, Proc. Amer. Acad. xxvi. 153.—Mexico.
 ——— *Pringlei* Watson, Proc. Amer. Acad. xxvi. 153.—Mexico.
 7041. *Arethusa grandiflora* Watson, Proc. Amer. Acad. xxvi. 154.—Mexico.
 7043. *Pogonia Mexicana* Watson, Proc. Amer. Acad. xxvi. 154.—Mexico.
 7066. *Habenaria filifera* Watson, Proc. Amer. Acad. xxvi. 154.—Mexico.

BROMELIACEÆ.

7167. *Æchmea Bernoulliana* Wittmack, Engler, Bot. Jahrb. xiv. beibl. nr. 32.1.—Guatemala.
 ——— *Iguana* Wittmack, Engler, Bot. Jahrb. xiv. beibl. nr. 32.3.—Guatemala.
 7182. *Pitcairnia Carioana* Wittmack, Engler, Bot. Jahrb. xiv. beibl. nr. 32.4.—Guatemala.
 7186. *Hechtia pedicellata* Watson, Proc. Amer. Acad. xxvi. 155.—Mexico.
 7192. *Tillandsia cucaënsis* Wittmack, Engler, Bot. Jahrb. xiv. beibl. nr. 32.7.—Guatemala.
 ——— *cylindrica* Watson, Proc. Amer. Acad. xxvi. 155.—Mexico.
 ——— *Pringlei* Watson, Proc. Amer. Acad. xxvi. 155.—Mexico.
 ——— *remota* Wittmack, Engler, Bot. Jahrb. xiv. beibl. nr. 32.6.—Guatemala.

IRIDEÆ.

7248. *Sisyrinchium platyphyllum* Watson, Proc. Amer. Acad. xxvi. 155.—Mexico.

AMARYLLIDÆ.

7337. *Agave brunnea* Watson, Proc. Amer. Acad. xxvi. 156.—Mexico.
 ——— *Hartmani* Watson, Proc. Amer. Acad. xxvi. 156.—Mexico.

LILIACEÆ.

7411. *Dasyllirion inerme* Watson, Proc. Amer. Acad. xxvi. 157.—Mexico.
 7431. *Anthericum*.
 Hesperanthes albomarginata Jones, Zoe, ii. 251.—Utah.
 7434. *Eccheandia nodosa* Watson, Proc. Amer. Acad. xxvi. 156.—Mexico.
 7512. *Erythronium grandiflorum*, var. *parviflorum* Watson, Proc. Amer. Acad. xxvi. 129.
 ——— *mesochoreum* Knerr, Midland College Monthly ii. 5; Proc. Amer. Acad. xxvi. 128.—Iowa and Kansas.
 ——— *montanum* Watson, Proc. Amer. Acad. xxvi. 130.—Oregon and Washington.
 ——— *revolutum*, var. *Bolanderi* Watson, Proc. Amer. Acad. xxvi. 129.—California.

COMMELINEÆ.

- 7587.** *Tinantia modesta* Brandegee, Proc. Cal. Acad. ser. 2. iii. 175.—Lower California.
7588. *Tradescantia Palmeri* Rose, Contr. Nat. Herb. i. 113.—Mexico.
 ——— *Pringlei* Watson, Proc. Amer. Acad. xxvi. 157.—Mexico.
7594. *Leptorhæo tenuifolia* Rose, Contr. Nat. Herb. i. 113.—Mexico.

PALMÆ.

- 7668.** *Chamaëdorea Pringlei* Watson, Proc. Amer. Acad. xxvi. 157.—Mexico.

AROIDEÆ.

- 7806.** *Philodendron Donnell-Smithii* Engler in Donnell-Smith, Pl. Guat. pt. ii. 77.—Guatemala.
 ——— *Guatemala* Engler in Donnell-Smith, Pl. Guat. pt. ii. 77.—Guatemala.
7828. *Syngonium Donnell-Smithii* Engler in Donnell-Smith, Pl. Guat. pt. ii. 77, 78.—Guatemala.

TRIURIDEÆ.

- 7860.** *Triuris brevistylis* Donnell-Smith, Bot. Gaz. xvi. 14.—Guatemala.

NAIADACEÆ.

- 7887.** *Zostera Oregana* Watson, Proc. Amer. Acad. xxvi. 131.—Oregon.
 ——— *Pacifica* Watson, Proc. Amer. Acad. xxvi. 131.—Puget Sound, Monterey, and Santa Barbara.

ERIOCAULEÆ.

- 7891.** *Eriocaulon articulatum* Morong, Bull. Torr. Club, xviii. 353.
 ——— *Jaliscanum* Watson, Proc. Amer. Acad. xxvi. 157.—Mexico.
7895. *Lachnocaulon anceps* Morong, Bull. Torr. Club, xviii. 360.

CYPERACEÆ.

- 7988.** *Carex hystericina*, var. *angustior* Bailey, Contr. Nat. Herb. i. 126.—Arizona.
 ——— *monile*, var. *Pacifica* Bailey, Proc. Cal. Acad. ser. 2. iii. 105.—California.
 ——— *obnupta* Bailey, Proc. Cal. Acad. ser. 2. iii. 104.—California.
 ——— *quadrifida* Bailey, Proc. Cal. Acad. ser. 2. iii. 104.—California.
 ——— var. *lenis* Bailey, Proc. Cal. Acad. ser. 2. iii. 105.—California.
 ——— *straminea*, var. *festucacea* Hitchcock, Trans. St. Louis Acad. v. 525.
 ——— *trichocarpa*, var. *laeviconica* Hitchcock, Trans. St. Louis Acad. v. 524.

GRAMINEÆ.

- 7990.** *Zea canina* Watson, Proc. Amer. Acad. xxvi. 160.—Mexico.
8020. *Andropogon macrourus*, var. *pumilus* Vasey, Bot. Gaz. xvi. 27.—Texas.
8027. *Hilaria cenchroides*, var. *ciliatus* Scribner, Proc. Acad. Phil. 1891. 293.—Mexico.
8045. *Paspalum setaceum*, var. *pubiflorum* Vasey, Contr. Nat. Herb. i. 114.—Mexico.

- 8050.** *Panicum fasciculatum*, var. *disitiflorum* Vasey, Proc. Cal. Acad. ser. 2. iii. 177.
 ——— *hians*, var. *purpurascens* Scribner, Proc. Acad. Phil. 1891. 296.—Mexico.
- 8089.** *Aristida Californica*, var. *glabrata* Vasey, Proc. Cal. Acad. ser. 2. iii. 178.
- 8096.** *Muhlenbergia Alamosæ* Vasey, Bot. Gaz. xvi. 146.—Mexico.
 ——— *articulata* Scribner, Proc. Acad. Phil. 1891. 298.—Mexico.
 ——— *Schaffneri*, var. *longiseta* Scribner, Proc. Acad. Phil. 1891. 297.
- 8111.** *Sporobolus complanatus* Scribner in Pringle, Pl. Mex. 1890; Proc. Acad. Phil. 1891. 299.
 ——— *pilosus* Vasey, Bot. Gaz. xvi. 26.—Kansas.
- 8124.** *Calamagrostis densus* Vasey, Bot. Gaz. xvi. 147.—Southern California.
 ——— *kœlerioides* Vasey, Bot. Gaz. xvi. 147.—Southern California.
- 8145.** *Deschampsia Pringlei* Scribner, Proc. Acad. Phil. 1891. 300.—Mexico.
- 8155.** *Danthonia Mexicana* Scribner, Proc. Acad. Phil. 1891. 301.—Mexico.
- 8167.** *Schedonnardus paniculatus* Trelease in Branner and Coville, Bot. Geol. Surv. Ark. 1888. iv. 236.
- 8169.** *Bouteloua Alamosana* Vasey, Contr. Nat. Herb. i. 115.—Mexico.
 ——— *Americana* Scribner, Proc. Acad. Phil. 1891. 306.
 ——— *stolonifera* Scribner, Proc. Acad. Phil. 1891. 302.—Mexico.
 ——— *Triæna* Scribner, Proc. Acad. Phil. 1891. 307.
 ——— *uniflora* Vasey, Bot. Gaz. xvi. 26.—Texas.
- 8181.** *Leptochloa Mexicana* Scribner, Proc. Acad. Phil. 1891. 302.—Mexico.
 ——— *spicata* Scribner, Proc. Acad. Phil. 1891. 304.
- 8195.** *Orcuttia Greenei* Vasey, Bot. Gaz. xvi. 146.—California.
Eragrostis interrupta Trelease in Branner and Coville, Bot. Geol. Surv. Ark. 1888. iv. 237.
 ——— *Pringlei* Scribner in Pringle, Pl. Mex. 1890; Proc. Acad. Phil. 1891. 304.
 ——— *spicata* Vasey, Bot. Gaz. xvi. 146.—Lower California.
- 8224.** *Melica multinervosa* Vasey, Bot. Gaz. xvi. 235.—Texas.
- 8225.** *Diarrhena diandra* Hitchcock, Trans. St. Louis Acad. v. 529.
- 8260.** *Brachypodium pinnatum*, var. *cæspitosus* Scribner, Proc. Acad. Phil. 1891. 305.—Mexico.

CONIFERÆ.

- 8309.** *Pinus Donnell-Smithii* Masters in Donnell-Smith, Pl. Guat. pt. ii. 72; Bot. Gaz. xvi. 199.—Guatemala.
 ——— *monophylla*, var. *edulis* Jones, Zœc. ii. 251.—Colorado.
- 8313.** *Picea nigra*, var. *cœrulea* Sudworth, Trees of Washington, D. C. [9].—In cultivation.
- 8339.** *Torreya*.
Tumion Californicum Greene, Pitt. ii. 195.
 ——— *grande* Greene, Pitt. ii. 194.
 ——— *nuciferum* Greene, Pitt. ii. 194.
 ——— *taxifolium* Greene, Pitt. ii. 194.

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- 30.*** *Pellæa Pringlei* Davenport, Gard. and For. iv. 555.—Mexico.
- 38.*** *Asplenium Ascensionis* Watson, Proc. Amer. Acad. xxvi. 163.—Ascension Island.

¹ As Durand's index includes only the Phanerogams, the Pteridophytes are arranged in the National Herbarium according to Hooker's Species Filicum. These numbers being duplicates of Durand's are distinguished in the National Herbarium and in this paper by means of an asterisk *.—J. N. Rose, Acting Botanist.

- 38.* *Asplenium dubiosum* Davenport, Gard. and For. iv. 483.—Mexico.
 ——— *Pringlei* Davenport, Gard. and For. iv. 449.—Mexico.
- 44.* *Nephrodium ascendens* Donnell-Smith, Bot. Gaz. xvi. 14.
 ——— *viscidum* Watson, Proc. Amer. Acad. xxvi. 163.—Ascension Island.
- 50.* *Notholaena Lemmoni*, var. *straminea* Davenport, Gard. and For. iv. 519.—Mexico.
 ——— *Nealleyi*, var. *Mexicana* Davenport, Bot. Gaz. xvi. 54.—Mexico.
 ——— *rigida* Davenport, Gard. and For. iv. 519.—Mexico.
- 59.* *Hemionitis elegans* Davenport, Gard. and For. iv. 484.—Mexico.

II.—ALPHABETIC INDEX.

- Acacia**
 filicoides.
Acalypha
 aliena.
 flavescens.
 longipes.
 dissitifolia.
 multispicata.
Accrates
 Floridana.
Achaetogeron
 linearifolius.
Achroanthos
 corymbosa.
 Floridana.
 maianthemifolia.
 monophylla.
 montana.
 ochreatea.
 Pringlei.
 purpurea.
 umbellulata.
Actinella
 Texana.
Adenostegia
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 Kingii.
 laxiflora.
 maritima.
 mollis.
 Nevinii.
 Oreuttiana.
 Parryi.
 pilosa.
 var. Bolanderi.
 Pringlei.
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 rigida, *var. brevibracteata*.
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 Bernoulliana.
 Iguana.
- Æschynomene**
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 Brunnea.
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 Chilensis.
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 var. Greenei.
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 heterophylla.
 hirsuta.
 laciniata.
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 major.
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 plebeia.
 Pöppigii.
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Alchemilla
 arvensis, *var. glabra*.
Alsinnella
 ciliata.
 crassicaulis.
 occidentalis.
 sagmoides.
Amelanchier
 glabra.
 pallida.
Ammannia
 Koehnei.

Amorpha
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Andropogon
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 Hepatica, var. *acuta*.
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 diversifolia.
 oblongifolia.
Aphanostephus
 Pinulensis.
 skirrobasis.
Aplopappus
 stoloniferus, var. *glabratus*.
Apodanthes
 globosa.
 Pringlei.
Aquilegia
 calcarata.
Arabis
 Macounii.
 Virginica.
Aretostaphylos
 media.
 patula.
 pungens, var. *cratericola*.
Arethusa
 grandiflora.
Aristida
 Californica, var. *glabrata*.
Aristolochia
 nana.
Arracacia
 Mariana.
 multifida.
Arthrosteium
 parvifolia.
Asplenium
 Ascensionis.
 dubiosum.
 Pringlei.
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 Oreuntii.
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Astragalus
 argillosus.
 asclepiadoides.

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 bisulcatus, var. *Haydenianus*.
 coccineus.
 Coltoni.
 desperatus.
 Haydenianus, var. *major*.
 var. *Nevadensis*.
 Moencoppensis.
 salulosus.
 Sileranus.
 sophoroides.
Atriplex
 corrugata.
Axinea
 Costaricensis.
Ayenia
 Jaliscana.
 paniculata.
 truncata.
 Wrightii.
Bacopa
 amplexicaulis.
 repens.
 rotundifolia.
Bahia
 desertorum.
 Schaffneri.
Basilima
 millefolium.
Bassovia
 Donnell-Smithii.
 Mexicana.
 var. *latifolia*.
Begonia
 Californica.
 Pringlei.
Berberis
 dictyota.
 pumila.
Berlandiera
 pumila.
Besleria
 Pansamalana.
Bidens
 Alamosana.
 Antiguensis.
 Dahlioides.
Bigelovia
 glareosa.
Biolettia
 riparia.
Blakea
 Pittierii.
 subpeltata.

Bletia

Palmeri.

Bocconia

vulcanica.

Boerhaavia

Alamosana.

octandra.

Sonora.

Boisduvallia

densiflora, var. imbricata.

stricta.

Bouteloua

Alamosana.

stolonifera.

uniflora.

Boykinia

elata.

ranunculifolia.

Brachistus

Escuintlensis.

Brachypodium

pinnatum, var. caespitosus.

Breweria

tenella.

Brickellia

Pacayensis.

Brongniartia

Palmeri.

Buddleia

Chapalana.

Wrightii.

Bunchosia

Pringlei.

Sonorensis.

Bursera

cerasifolia.

Cacalia

poculifera.

Cæsalpina

placida.

Calamagrostis

densus.

kœlerioides.

Calamintha

glabra.

Callitriche

longipedunculata.

Capnodes

Bidwellianum.

Caseanum.

Capnorchis

ochroleuca.

pauciflora.

Cardamine

Californica.

cardiophylla.

Carex

hystericina, var. angustior.

monile, var. Pacifica.

obnupta.

quadrifida.

var. lenis.

straminea, var. festuacea.

trichocarpa, var. læviconica.

Carlowrightia

fimbriata.

pectinata.

Carya

Fernowiana.

Castalia

Mexicana.

reniformis.

Castanea

Castanea, var. Americana.

Castilleja

macrostigma.

Ceanothus

cuneatus, var. ramulosus.

rugosus.

Cephalis

glomerulata.

Cerastium

erectum.

Cerasus

Californica.

Cercocarpus

Arizoniens.

parvifolius, var. breviflorus.

Cereus

striatus.

Chenactis

scaposa.

Chamaedorea

Pringlei.

Chomelia

Pringlei.

Chorisia

soluta.

Chorizanthe

Nortoni.

Chrysamphora

Californica.

Citharexylum

Berlandieri.

Cinaloanum.

Cladothrix

cryptantha.

Clarkia
grandiflora.
Claytonia
perfoliata, var. amplexens.
var. angustifolia.
var. carnosa.
Clematis
Palmeri.
Cleome
ephemera.
Cleomella
Palmerana.
Clibadium
Donnell-Smithii.
Clidemia
Biolleyana.
Donnell-Smithii.
laxiflora, var. longipetiolata.
Naudiniana.
Cnicus
linearifolius.
velatus.
Collomia
Pringlei.
Cologania
Jaliscana.
Conostegia
Bernoulliana.
Cooperi.
Donnell-Smithii.
hirtella.
lanceolata.
Mexicana.
Montelegreana.
puberula.
Cordia
Pringlei.
Sonoræ.
Coronopus
Coronopus.
Cotyledon
nubigena.
Coublandia
Mexicana.
Coursetia
axillaris.
Croton
Alamosanum.
calvescens.
elaagnoides.
Cruminium
Virginianum.
Crusea
megalocarpa.

Cyclanthera
testudinea.
Cymopterus
decipiens.
megacephalus.
Dahlia
dissecta.
pubescens.
Dalea
maritima.
Dalechampia
scandens, var. trisecta.
Danthonia
Mexicana.
Daphnopsis
Tuerckheimiana.
Dasyllirion
inermis.
Deschampsia
Pringlei.
Desmanthus
Cooleyi.
fruticosus.
oligospermus.
Desmodium
amaus.
Jaliscanum, var. obtusum.
Lindheimeri.
prostratum.
subspicatum.
Dianthera
ovata.
Diarrhena
diandra.
Dicliptera
formosa.
Diphysa
racemosa.
Drymaria
carinata.
polystachya.
Dysodia
papposa.
Echeandia
nodosa.
Echinocystis
cirrhopedunculata.
Echinopepon
cirrhopedunculatus.
Ehretia
Mexicana.
Encelia
nutans.

Epilobium

adenocaulon, var. *occidentale*.
var. *perplexans*.

clavatum.
delicatum.

var. *tenue*.

holosericeum.

leptocarpum, var. *Macounii*.

lineare, var. *oliganthum*.

Oregonense, var. *gracillimum*.

paniculatum, var. *jucundum*.

rigidum, var. *canescens*.

ursinum.

var. *subfalcatum*.

Eragrostis

interrupta.

Pringlei.

spicata.

Erigeron

Alamosanum.

aureus.

Californicus.

Chihuahuensis.

coronarius.

Forreri.

fraternus.

Galeottii.

multiceps.

Seemannii.

stolonifer.

strigosus.

Wislizeni.

Eriocaulon

articulatum.

Jaliscanum.

Eriogonum

agninum.

dasyanthemum, var. *Jepsonii*.

deserticola.

elegans.

flexum.

minutiflorum.

Nortoni.

vineum, var. *caninum*.

Eriogynia

Hendersoni.

Eriophyllum

Jepsonii.

Erodium

Californicum.

Eryngium

Mexicanum.

Erysimum

arenicola.

capitatum.

Erythraea

Pringleana.

Erythronium

grandiflorum, var. *parviflorum*.

mesochoreum.

montanum.

revolutum, var. *Bolanderi*.

Esenbeckia

flava.

Eupatorium

ageratifolium, var. *purpureum*.

Chapalense.

Donnell-Smithii.

var. *parvifolium*.

Espinosaum, var. *subintegrifolium*.

lyratum.

Madrense.

Rafaelense.

Euphorbia

biserrata.

digitata.

incerta.

misella.

rugulosa.

tuberosa.

subpeltata.

Watsonii.

Ficus

Guadalajarana.

Jaliscana.

Pringlei.

radulina.

Fimbristemma

calycosa.

Flörkea

alba.

rosea.

Frasera

Utahensis.

Fraxinus

viridis, var. *pubescens*.

Galactia

discolor.

Gaudichaudia

Uhdeana.

Gayophytum

lasiospermum.

Gentiana

quinquefolia, var. *occidentalis*.

Gerardia

punctata.

Genm

Canadense, var. *flavum*.

Gilia

Howardi.

Godetia
 pulcherrima.
Gollonema
 heterophyllum.
Gonolobus
 parviflorus, var. brevicoronatus.
Govenia
 elliptica.
Gurania
 Donnell-Smithii.
Gyminda
 Grisebachii.
Gymnanthes
 Pringlei.
Gymnolomia
 decumbens.
Habenaria
 filifera.
Hechtia
 pedicellata.
Heeria
 axillaris.
Heliotropium
 Pringlei.
Hemionitis
 elegans.
Henrya
 imbricans.
Hepatica
 Hepatica.
Herpestis
 acuminata.
 auriculata.
Hesperanthes
 albomarginata.
Heteropteris
 retusa.
Heterotoma
 aurita.
Hicoria
 Fernowiana.
Hilaria
 cenchroides, var. ciliatus.
Hosackia
 Alamosana.
 sericea.
Hymenatherum
 anomalum.
Hymenopappus
 radiata.
Hypericum
 anagalloides, var. Nevadense.
 Canadense, var. boreale.
Hyptis
 collina.

Iothyomethia
 Pisicpula.
Ilex
 Caroliniana.
Ipomea
 alata.
 Bernouilliana.
 brevipes.
 Grayi.
 Leonensis.
 macrantha.
 nuda.
 rostrata.
 Schrenkiana.
 sericophylla.
 Tortugensis.
Isopyrum
 trifolium.
Jacksonia
 tenuifolia.
 trachysperma.
 uniglandulosa.
Juglans
 Mexicana.
Jussiaea
 Peruviana, var. glaberrima.
 pilosa, var. robustior.
Justicia
 Pringlei.
Kraunhia
 australis.
 brachybotrys.
 Chinensis.
 magasperma.
Krynitzkia
 glomerata, var. acuta.
Kuhnia
 eupatorioides, var. glutinosa.
Lachnocaulon
 anceps.
Lactuca
 spicata.
Laphamia
 Gilensis.
Lappula
 ciliata.
 dellea.
 diffusa.
 floribunda.
 hispida.
 Mexicana.
 nervosa.
 pinetorum.
 Redowskii.
 ursina.
 Virginiana.

- Laurentia**
 Michoacana, var. *ovatifolia*.
 ovatifolia.
- Leandra**
 cornoides, var. *hirtella*.
 cornoides, var. *latifolia*.
 Costaricensis, var. *angustifolia*.
 var. *hirsutior*.
- Lepidium**
 nitidum, var. *insigne*.
- Leptochloa**
 Mexicana.
 spicata.
- Leptorhœo**
 tenuifolia.
- Liatris**
 Helleri.
- Lilæopsis**
 lineata.
- Lippia**
 formosa.
 montana.
- Lobelia**
 laxiflora, var. *insignis*.
 novella.
- Lotus**
 Alamosana.
- Ludwigia**
 diffusa.
 var. *Californica*.
- Luina**
 Piperi.
- Lupinus**
 albicaulis, var. *silvestris*.
 albifrons, var. *collinus*.
 confertus, var. *Wrightii*.
 formosus.
 var. *Bridgesii*.
 longipes.
 memoralis.
- Lysiloma**
 Acapulcensis, var. *brevispicata*.
 Watsoni.
- Macfadyena**
 simplicifolia.
- Macleania**
 cordata, var. *linearifolia*.
- Madia**
 hispida.
- Malvastrum**
 fasciculatum.
 multiflorum.
 orbiculatum.
 Parryi.
- Mamillaria**
 Notesleini.
 Roseana.
- Manihot**
 Pringlei.
- Mapouria**
 parvifolia.
- Marshallia**
 trinervia.
- Melampodium**
 bibracteatum.
 glabrum.
 sinnuatum.
- Melica**
 multinervosa.
- Melothria**
 Donnell-Smithii.
 var. *hirtella*.
 var. *rotundifolia*.
- Mendoncia**
 cleistophylla.
- Mentzelia**
 nitens.
- Metastelma**
 latifolia.
- Miconia**
 biperulifera.
 Bourgaeana.
 Carioana.
 Costaricensis.
 glabrata.
 Guatemalensis.
 humilis.
 Liebmannii.
 paleacea.
 Pittierii.
 Schlectendalii.
 Tonduzii.
 var. *cuneata*.
 var. *furfuracea*.
 var. *latifolia*.
 var. *oblongifolia*.
 var. *serrulata parvifolia*.
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- Micranpeltis**
 cirrhopedunculata.
 fabacea, var. *agrestis*.
- Micranthemum**
 micranthemoides.
- Microstylis**
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- Mimosa**
 affinis.
 Palmeri.

- Mimulus**
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Mimusops
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Mirabilis
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Mollugo
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Monolepis
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Montia
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 Hallii.
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 parvifolia.
Mouriria
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Muhlenbergia
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 Schaffneri, var. longiseta.
Myriocarpa
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Nephradenia
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Nephrodium
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 Nealleyi, var. Mexicana.
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Oenothera
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Oligonema
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Omphalodes
 acuminata.
Opuntia
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Oreuttia
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Oreopanax
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Osmaronia
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Otopappus
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Oxytheca
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Panicum
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Parathesis
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Paspalum
 setaceum, var. pubiflorum.
Passiflora
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 clypeophylla.
 dictiophylla.
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- Paullinia
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 Pellaea
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 Pitcairnia
 Carioana.
 Pithecolobium
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 Mexicanum.
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 Pogonia
 Mexicana.
 Polygala
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 Kelloggii.
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 Donnell-Smithii.
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 var. *reflexa*.
 Gordonii, var. *lycopodioides*.
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 Psilostrophe
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 tagetina.
 var. *sparsiflora*.
 Pulsatilla
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 occidentalis.
 Pyrus
 Ivensis.
 Soulardi.
 Ranunculus
 Grayi.
 pedatifidus, var. *cardiophyllus*.
 vagans.
 Rhamnus
 crocea, var. *ilicifolia*.
 Rhododendron
 Sonomense.
 Rhus
 Palmeri.

Rosa

- gratissima.*
Sonomensis.

Rubus

- Canadensis*, var. *invisus.*
var. *roribaceus.*
Millsparghi.
nanus.
occidentalis, var. *grandiflora.*
villosus, var. *albinus.*
var. *sativus.*

Russelia

- coccinea.*

Sabbatia

- dichotoma.*

Salicornia

- occidentalis.*

Salix

- Brownii*, var. *petraea.*
macrocarpa, var. *argentea.*

Salmea

- Palmeri.*

Sulvia

- Alamosana.*

Samolus

- Valerandi*, var. *repens.*

Sanicula

- Canadensis*, var. *Marylandica.*

Sargenia

- Pringlei.*

Saxifraga

- Howellii.*

Schedonnardus

- paniculatus.*

Schizocarpum

- Palmeri.*

Schizonotus

- ariaefolius.*

Schrankia

- Intsia.*

Schultesia

- Mexicana.*

Sclerocarpus

- spatulatus.*

Scutellaria

- hispidula.*

Sebastiania

- Palmeri.*
Pringlei.

Senecio

- Cobanensis.*
Donnell-Smithii.
Ghiesbreghtii, var. *pauciflorus.*
Guadalajarensis.

Senecio—Continued.

- Hesperius.*
Jaliscana.
Rawsonianus.

Serjania

- psilophylla.*
rachiptera.
rufisepala.

Sicyos

- longisepalus.*

Sida

- Alamosana.*

Sidalcea

- delphinifolia.*
var. *humilis.*
secundiflora.

Silene

- Macounii.*
Suksdorfii.

Sisymbrium

- canescens*, var. *alpestre.*
crenatum.
multiracemosum.

Sisyrinchium

- platyphyllum.*

Sitilias

- grandiflora.*
multicaulis.
pauciflora.
Rothrockii.
Sesscana.

Solanum

- Donnell-Smithii.*
Grayi.

Solenophora

- erubescens.*

Solidago

- juncea*, var. *ramosa.*

Somnera

- sabiceoides.*

Sphaeralcea

- subhastata.*

Spilanthes

- Botterii.*

Spiraea

- discolor*, var. *ariaefolia.*
rubra.

Spiranthes

- Jaliscana.*
Pringlei.

Spondias

- Radlkoferi.*

Sporobolus

- complanatus.*
pilosus.

Stachys
 aspera, var. *tenuiflora*.
Stanleya
 albescens.
 elata.
Steironema
 quadriflorum.
Stellaria
 montana.
Streptanthus
 Californicus.
 inflatus.
 Mildredæ.
 orbiculatus.
 Parryi.
 secundus.
Styrax
 Jaliscana.
Symplocos
 Benthami.
 Pringlei.
Syngonium
 Donnell-Smithii.
Tabebuia
 Palmeri.
Talinum
 Coahuilense.
Tellima
 nudicaulis.
 scabrella.
Tephrosia
 cana.
Tetragonotheca
 Guatemalensis.
Thalictrum
 dioicum, var. *coriaceum*.
Thelypodium
 aureum.
 Hookeri.
 procerum.
Thysanocarpus
 curvipes, var. *involutus*.
 var. *pulchellus*.
Tibouchina
 Bourgeana.
 Ferrariana.
 Galeottiana.
 longisepala.
 Mexicana.
 monticola.
 Naudiniana.
 rufipilis.
 var. *hirsuta*.
 scabriuscula.
 Schiedeana.
 Trianaei.

Tillaea
 Bolanderi.
Tillandsia
 cucaënsis.
 cylindrica.
 Pringlei.
 remota.
Tinantia
 modesta.
Tissa
 Clevelandi.
 salina, var. *Sanfordi*.
 var. *sordida*.
Tithonia
 fruticosa.
 macrophylla.
 Palmeri.
Topobea
 Maurofernanandeziana.
 Pittierii.
 Watsonii.
Tradescantia
 Palmeri.
 Pringlei.
Trifolium
 amœnum.
 Macraei, var. *albo-purpureum*.
 roscidum.
 tridentatum, var. *scabrellum*.
 trilobatum.
 variegatum, var. *melananthum*.
Triuris
 brevistylis.
Tropidocarpum
 gracile, var. *scabriusculum*.
Tunion
 Californicum.
 grande.
 nuciferum.
 taxifolium.
Vaseyanthus
 Rosci.
Verbesina
 erosa.
 scaposa.
Vernonia
 gigantea.
 graminifolia.
 marginata.
 Palmeri.
 Salvinæ, var. *canescens*.
Vicia
 Californica.
 leucophæa, var. *mediocincta*.
 linearis.

Viguiera

- leptocaulis.
- montana.

Viola

- palmata, var. obliqua.
- purpurea, var. pinetorum.

Willardia

- Mexicana.

Withania

- melanocystis.

Xylosma

- Pringlei.

Xylothermia

- montana.

Zea

- canina.

Zexmenia

- dulcis.
- fruticosa.

Zimapania

- Schiedeana.

Zinnia

- linearis, var. latifolia.

Zostera

- Oregana.
- Pacifica.

LIST OF PLANTS COLLECTED BY C. S. SHELDON AND M. A. CARLETON IN INDIAN TERRITORY IN 1891.

By J. M. HOLZINGER.

This paper is a report on two collections of plants, chiefly from Indian Territory, the first made by Mr. C. S. Sheldon, the other by Mr. M. A. Carleton, whose paper on the native plants of Oklahoma Territory and adjacent districts appears herewith.

Mr. Sheldon collected during June, July, and August in the southern half of the territory. Mr. Carleton was in the field from the middle of April to the last of September, covering the north half of Indian Territory and the adjacent parts of Kansas, New Mexico, and Texas.

Valuable help and suggestions were received in the determinations from Dr. George Vasey, who also determined the grasses. The Carices were referred for verification to Prof. L. H. Bailey.

I.—C. S. SHELDON'S COLLECTION.

Mr. Sheldon's route lay through Colbert, Caddo, Atoka, the Sans Bois Mountains, Stonewall, McAlester, Erin Springs, Fort Sill, Cash Creek, Anadarko, the Washita River, Mount Scott, the Shawnee Hills, and Hartshorn.

MENISPERMACEÆ.

Cocculus Carolinus DC. Quite variable. Frequent throughout southern Indian Territory. August. No. 258.

CRUCIFERÆ.

Wasturtium officinale R. Br. Abundant at Cress Creek, but not seen elsewhere in the Territory. August. No. 264.

CAPPARIDÆ.

Cleomella angustifolia Torr. On wet ground near streams. Fort Sill. July. No. 244.

Polanisia uniglandulosa DC. Quanah's ranch. July. No. 213.

CISTINEÆ.

Lechea major Mx. Stonewall, Chickasaw Nation. Infrequent. July. No. 124.

Lechea tenuifolia Mx. Quanah's ranch. Gravelly soil. Common, but local. July. No. 205.

POLYGALEÆ.

- Polygala alba** Nutt. Gravelly hills, west of Paul's Valley. Not seen elsewhere. July. No. 152.
Polygala incarnata L. Colbert. Abundant in rich prairies easterly. June. No. 31.
Polygala sanguinea L. Atoka. Low ground. June. No. 59.
Polygala verticillata L. Prairies along Cash Creek, near Fort Sill. July. No. 161.
Polygala ambigua Nutt. Sans Bois Mountains. Rocky ridges. July. No. 92.
Krameria secundiflora DC. Colbert; Wichita Mountains. Rich woods. August. No. 3.

CARYOPHYLLEÆ.

- Arenaria Michauxii** Hook. Stonewall. Gravelly stone hills. July. No. 138.

PORTULACEÆ.

- Portulaca pilosa** L. Quanah's ranch. Low ground. July. No. 208.
Talinum parviflorum Nutt. Sans Bois Mountains. Frequent on rocky hills throughout the Territory.

MALVACEÆ.

- Callirrhoe digitata** Nutt. Sans Bois Mountains. Rich open pine woods. July. No. 102.

LINEÆ.

- Linum rigidum** Pursh. Caddo. Dry limestone hills. June. No. 43.
Linum sulcatum Riddell. Caddo. Prairies. Common throughout. June. No. 56.
Linum Virginianum L. Sans Bois Mountains. Rich open woods. Flowers small, of a light straw color. July. No. 105.

GERANIACEÆ.

- Oxalis violacea** L. Rocky places on a mountain near Quanah's ranch. Abundant on Mount Scott and probably throughout Wichita Mountains. July. No. 228.
 This plant has the scaly bulb of the species to which it is here referred. The flowers are, however, rather larger, and no plants could be found with leaves. The Indians familiar with it claimed that it never had leaves. But this is probably an error. In dry seasons plants in bloom and having no leaves are found in Minnesota.

RUTACEÆ.

- Ptelea trifoliata** L., var. *mollis* Torr. and Gray. Signal Mountain. Westward. Rocky hills. July. No. 247.

ILICINEÆ.

- Ilex decidua** Walt. McAlester. Along creeks. East. August. No. 296.

RHAMNEÆ.

- Rhamnus Caroliniana** Walt. McAlester. Along creeks. August. No. 295.
Ceanothus Americanus L. Colbert. Not seen in the western part of the Territory. June. No. 7.

AMPELIDACEÆ.

- Vitis cordifolia** Mx. Chickasaw Creek, near Stringtown. June. No. 74.
Vitis rupestris Scheele. Quanah's ranch. Banks of Sandy Creek. Common westward. July. No. 219.
Ampelopsis quinquefolia Mx. Quanah's ranch. July. No. 240.
Cissus Ampelopsis Pers. Mount Scott. Creek banks. August. No. 253.
Cissus incisa Desmoul. Quanah's ranch. Climbs over *Symphoricarpos*, *Juniperous*, etc. July. No. 189.

ANACARDIACEÆ.

Rhus Canadensis Marsh, var. *trilobata* Gray. Quanah Mountain.¹ Rocky slopes July. No. 200.

Rhus copallina L. McAlester. Hills and prairies. Abundant eastward. July No. 123.

LEGUMINOSÆ.

Baptisia sphærocarpa Nutt. Colbert. Sandy soil. June. No. 17.

Crotalaria ovalis Pursh. Colbert. Sandy banks. June. No. 115.

Hosackia Purshiana Benth. Quanah's ranch. July. No. 214.

Psoralea cuspidata Pursh. Caddo. Rocky hills. Not noted elsewhere. June. No. 50.

Psoralea simplex Nutt. Atoka. Low ground. Not uncommon throughout. June. No. 60.

Dalea aurea Nutt. Five miles west of Stonewall. Prairies. Very abundant. July. No. 133.

Dalea laxiflora Pursh. Paul's Valley. Prairies and hills. July. No. 148.

Petalostemon candidus Mx. Colbert and Stonewall. Upland prairies. Abundant. June, July. Nos. 12, 268.

Petalostemon multiflorus Nutt. Wichita Mountains. Abundant west of the Chickasaw Nation on prairies and rocky slopes. August. No. 259.

Petalostemon violaceus Mx. Colbert and Stonewall. Gravelly prairie. June, July. Nos. 13, 31.

Indigofera leptosepala Nutt. Erin Springs. Frequent westward to Green County. In sandy soil, along streams. July. No. 155.

Tephrosia onobrychoides Nutt. Atoka. Sandy prairies. June. No. 67.

Tephrosia virginiana Pers. Colbert. Upland prairies. Abundant as far west as the Santa Fe Railroad. June. No. 11.

Sesbania macrocarpa Muhl. McAlester. Evidently introduced. August. No. 320.

Astragalus Canadensis L. Sans Bois Mountains. Creek banks. July. No. 100.

Stylosanthes elatior Swartz. Colbert. Dry, sandy prairies. Common in the eastern part. June. No. 20.

Desmodium acuminatum DC. Erin Springs. Open thickets. July. No. 176.

Desmodium Dillenii Darl. Sans Bois Mountains. Not common. August. No. 315.

Desmodium Illinoense Gray. Fort Sill. Frequent in sandy soil in low ground. August. No. 260.

Desmodium paniculatum DC. Along Cress Creek, 12 miles north of Fort Sill. August. No. 261.

Desmodium sessilifolium Torr. and Gray. Sans Bois Mountains. Rich woods. Frequent. July. No. 104.

Vicia exigua Nutt. Quanah Mountains. Common. July. No. 187.

Clitoria Mariana L. Sans Bois Mountains. Rocky pine woods. Common throughout in similar situations. July. No. 91.

Galactia mollis Mx. Quanah's ranch. Rich soil, in low ground. July. No. 210.

Phaseolus helvolus L. Quanah's ranch and Fort Sill. July. Nos. 220, 246.

Rhynchosia latifolia Nutt. Colbert. Rich prairies. Infrequent eastward. June. No. 112.

Cassia Chamæcrista L. Colbert. Abundant throughout. June. No. 19.

Cassia nictitans L. Sans Bois Mountains. Gravelly hills. August. No. 332.

Cassia Tora L. Sans Bois Mountains. Rich soil along creeks. Frequent, especially eastward. August. No. 282.

Prosopis juliflora DC. Fort Sill. Prairies. The "mesquit" of the Spaniards and Indians. July. No. 243.

¹Quanah Mountain is one of the Wichita Mountains. Mr. Sheldon gives it this name because it lies back of Quanah Parker's ranch. Quanah Parker is head chief of the Comanches. The Wichita Mountains are all very rocky, with cedars scattered over them.

- Neptunia lutea* Benth. Colbert. Abundant throughout. June. No. 30.
Desmanthus brachylobus Benth. Caddo. Common throughout. June. No. 33.
Acacia filicina Willd. Colbert. June. Nos. 5, 109.

MELASTOMACEÆ.

- Rhexia Mariana* L. Sans Bois Mountains. Rich, open ground. August. No. 311.

LYTHRARIÆ.

- Lythrum alatum* Pursh. Atoka. Frequent in low ground east. June. No. 58.

ONAGRARIÆ.

- Ludwigia cylindrica* Ell. McAlester. Muddy creek banks. June. No. 81.
Oenothera Missouriensis Sims. Quanah's ranch. Gravelly and rocky slopes. July. No. 237.
Oenothera serrulata Nutt. Colbert. High, dry, sandy prairies. June. No. 18.
Oenothera speciosa Nutt. Caddo. Gravelly, dry soil. June. No. 45.
Gaura biennis L. Gaines Creek. Prairies. August. No. 300.
Gaura sinuata Nutt. Cash Creek. Sandy prairies. July. No. 172.
Stenosiphon virgatus Spach. Stonewall. Common to Wichita Mountains. Gravelly and sandy prairies. July. No. 144.

LOASEÆ.

- Mentzelia oligosperma* Nutt. Quanah's ranch. Rocky slopes. July. No. 231.

CUCURBITACEÆ.

- Cucurbita foetidissima* HBK. Fort Sill. Roadsides and waste places. Apparently introduced. The fruit is somewhat smaller than a nutmeg melon. July. No. 183.
Cyclanthera dissecta Arn. Quanah's ranch. Rocky places. July. No. 229.

FICOIDEÆ.

- Mollugo verticillata* L. Signal Mountain. Near Fort Sill. Common in hard soil. August. No. 248.

UMBELLIFERÆ.

- Eryngium diffusum* Torr. Cash Creek. In a prairie-dog town. A prostrate, spreading plant. July. No. 169.
Zizia aurea Koch. Stringtown, along Chickasaw Creek. Low, sandy ground. June. No. 73.
Discopleura Nuttallii DC. Colbert and McAlester. June, July. Nos. 9, 122.
Eurytænia Texana Torr. and Gray. Anadarko. Gravelly soil. July. No. 147.
Bifora Americana Benth. and Hook. Caddo. Dry, gravelly soil. June. No. 41.
Trepocarpus æthusæ Nutt. Sans Bois Mountains. Creek banks, in black soil. July. No. 101.
Daucus pusillus Mx. Colbert. Sandy soil. June. No. 2907.

CORNACEÆ.

- Cornus candidissima* Marsh. McAlester. Low ground, along streams. June. No. 85.
Cornus florida L. Banks of Chickasaw Creek, near Stringtown. June. No. 72.

CAPRIFOLIACEÆ.

- Viburnum prunifolium** L. McAlester. Low ground. June. No. 86.
Symphoricarpus vulgaris Mx. McAlester. Low ground, along streams. June. No. 87.

RUBIACEÆ.

- Cephalanthus occidentalis** L. McAlester. Common. July. No. 120.
Houstonia angustifolia Mx. With *Cuscuta decora* Engelm, var. *indecora* Engelm. Caddo and Quanah Mountain. June, July. Nos. 42, 191.
Diodia teres Walt. Colbert. Dry banks. June. No. 28.
Galium circæzans Mx. Sans Bois Mountains. Rocky pine woods. Frequent. July. No. 93.
Galium pilosum Ait., var. *punctulosum* Torr. and Gray. Colbert. June. No. 111.

COMPOSITÆ.

- Vernonia Arkansana** DC. Gaines Creek and Sans Bois Mountains. On low prairies and along creeks. August. No. 297.
Vernonia Baldwinii Torr. Quanah's ranch. Abundant throughout. July. No. 222.
Vernonia Lettermani Engelm. Hartshorn. Rocky banks. September. No. 339.
Elephantopus Carolinianus Willd. Sans Bois Creek. Only eastward, not common. August. No. 322.
Eupatorium cœlestinum L. Gaines Creek and Sans Bois Mountains. Infrequent. August. No. 299.
Eupatorium serotinum Mx. Common along creek banks throughout the eastern part. No. 299.
Liatris acidota Engelm. and Gray. Sans Bois Mountains. Open and rocky hills. Mon from Shawnee Hills eastward. August. No. 293.
Liatris pycnostachya Mx. Stonewall. Prairies. Common. July. No. 126.
Liatris squarrosa Willd. Anadarko and Sans Bois Mountains. Frequent east. July, August. Nos. 168, 304.
Amphiachyris dracunculoides Nutt. Sans Bois Mountains. Abundant along roadsides. August. No. 329.
Grindelia lanceolata Nutt. Sans Bois Mountains. Open hills. More common westward in Chickasaw Nation. August. No. 308.
Chrysopsis pilosa Nutt. Sans Bois Mountains. Rocky hills. Common eastward. Westward *Xanthisma Texanum* takes its place. August. No. 321.
Chrysopsis villosa Nutt. Sandy hills west of Erin Springs. Common from there westward. July. No. 174.
Xanthisma Texanum DC. Fort Sill. Gravelly prairies. Abundant throughout. August. No. 269.
Aplopappus spinulosus DC. Cash Creek. Infrequent. July. No. 173.
Solidago nitida Torr. and Gray. Sans Bois Mountains. Common through Choctaw Nation, on rocky hills. August. No. 319.
Solidago radula Nutt. Sans Bois Mountains. Dry hills. Common here and in Shawnee Hills. August. No. 294.
Solidago rigida L. Common on rocky hills throughout the eastern portion of the Territory. August. No. 318.
Aphanostephus Arkansanus Gray. Erin Springs. Frequent from there to the western boundary of the Chickasaw Nation. On prairies. July. No. 149.
Aphanostephus ramosissimus DC. In a prairie-dog town near Cash Creek. Found frequently in similar situations throughout the western part of the Territory. July. No. 171.

- Chaetopappa asteroides** DC. Stringtown. Rich pine woods, in gravelly soil. June. No. 76.
- Boltonia diffusa** Ell. Sans Bois Mountains. In rich soil along streams. August. No. 240.
- Aster paludosus** Ait. Along Sans Bois Creek bottoms. Also frequent in open prairies through Choctaw Nation. August. No. 323.
- Aster patens** Ait., var. **gracilis** Hooker. Rocky woods near Hartshorn. Frequent eastward. September. No. 338.
- Engelmannia pinnatifida** Torr. and Gray. Caddo. Dry, gravelly hills. Infrequent. June. No. 44.
- Iva angustifolia** Nutt. Sans Bois Mountains; also at McAlester. Sandy uplands. August. No. 328.
- Iva ciliata** Willd. Sans Bois Mountains. Low ground. Not seen far westward. August. No. 330.
- Ambrosia bidentata** Mx. McAlester. Abundant everywhere. August. No. 314.
- Echinacea angustifolia** DC. Erin Springs and westward. Gravelly hills. Not common. July. No. 154.
- Rudbeckia amplexicaulis** Vahl. Caddo. Dry, gravelly soil. Common. June. No. 46.
- Rudbeckia maxima** Nutt. Stringtown. Low ground, in peaty soil. June. No. 70.
- Helianthus hirsutus** Raf. At the foot of the mountain near Quanah's ranch. Along streams. Common westward. July. No. 232.
- Helianthus strumosus** \times **decapetalus**. Rocky banks along Sans Bois Creek. August. No. 326.
- Verbesina virginica** L. Sans Bois Mountains. Along streams. Common from there westward through Choctaw Nation. Hardly in flower as yet. August. No. 316.
- Coreopsis grandiflora** Nutt. Colbert and McAlester. High prairies. June. Nos. 8, 88.
- Coreopsis tinctoria** Nutt. Colbert. Prairies. Common throughout, and variable in size, coloring, and divisions of leaves. June. No. 2.
- Thelesperma filifolium** Gray. Stonewall. Summit of limestone hill, where it is invariably dwarf and lacks the dark base to the rays; also at Quanah's ranch, along sandy creek banks. The plants are glaucous and the leaves invariably pellucid punctate. July. Nos. 135, 215.
- Hymenopappus artemisiæfolius** DC. Colbert. Common on dry prairies in the eastern part. June. No. 22.
- Hymenatherum tagetoides** Gray. Quanah's ranch. Open gravelly places. July. No. 204.
- Helenium tenuifolium** Nutt. McAlester. Roadsides and everywhere abundant. August. No. 289.
- Helenium tenuifolium** Nutt., var. **badium** Gray. Quanah's ranch and throughout Wichita Mountains. June. No. 198.
- Gaillardia lanceolata** Mx. McAlester and Stonewall. Sandy prairies. July. No. 125.
- Polypteris Texana** Gray. Quanah's ranch. Mostly along creeks, in sandy and gravelly soil. July. No. 197.
- Actinella linearifolia** Torr. and Gray. Stonewall. Common west to Wichita Mountains. July. No. 128.
- Cnicus altissimus** Willd. Sans Bois Mountains. Along creeks. Frequent, but not yet in flower. August. No. 292.
- Cnicus undulatus** Gray. Stonewall. July. No. 132.
- Centaurea Americana** Nutt. Colbert. June. No. 1.
- Hieracium longipilum** Torr. Stringtown. Gravelly hills. June. No. 71.
- Pyrhopappus Carolinianus** DC. McAlester. Common along roadsides and creeks. August. No. 313.

LOBELIACEÆ.

Lobelia puberula Mx. Sans Bois Mountains. Rich open ground. Not seen westward. August. No. 310.

Lobelia spicata Lam. Atoka. Low ground. Not seen elsewhere. June. No. 57.

OLEACEÆ.

Fraxinus pubescens Lam. Quanah's ranch. Sandy creek banks. July. Nos. 203, 221.

Fraxinus viridis Mx. Sans Bois Mountains. Along creek banks. Frequent. August. No. 275.

APOCYNACEÆ.

Amsonia angustifolia Mx. Quanah's ranch. Rocky hills. July. No. 224.

ASCLEPIADACEÆ.

Acerates viridiflora Ell. Caddo. Frequent west, less so eastward. June. No. 51.

Asclepias stenophylla Gray. McAlester. Prairies. June. No. 77.

Asclepias tuberosa L. Colbert. Frequent on prairies. The flowers are occasionally almost straw colored. June. No. 10.

Asclepias verticillata L. Sans Bois Mountains. Open woods, July. No. 89.

Asclepiodora viridis Gray. Colbert. Common on prairies. June (in fruit). No. 106.

GENTIANEÆ.

Erythræa Beyrichii Torr. and Gray. Erin Springs. Thins oil on gravelly hills. July. No. 153.

Sabbatia angularis Pursh. Sans Bois Mountains. Rich woods. July. No. 117.

Sabbatia campestris Nutt. Caddo. Universal and abundant, on prairies. June. No. 55.

Eustoma Russellianum Griseb. Prairie hillsides, near Paul's Valley. July. No. 146.

POLEMONIACEÆ.

Gilia coronopifolia Pers. Sans Bois Mountains and Quanah's ranch. Frequent. July. Nos. 103, 225.

HYDROPHYLLACEÆ.

Hydrolea ovata Nutt. Sans Bois Mountains. Not frequent. Boggy places on rocky hillsides. Found as far west as the western border of the Choctaw Nation. August. No. 307.

BORAGINEÆ.

Heliotropium tenellum Torr. Rocky hills near Caddo. June. No. 52.

Onosmodium Carolinianum DC.¹ Between Stonewall and Paul's Valley. Frequent. July. No. 141.

CONVOLVULACEÆ.

Ipomœa leptophylla Torr. Anadarko. Dry prairies. July. No. 177.

Convolvulus incanus Vahl. Quanah's ranch. Rocky slopes. July. No. 230.

Evolvulus argenteus Pursh. Caddo. June. No. 53.

Cuscuta glomerata Choisy. Cress Creek. Abundant on Composites. August. No. 263.

¹ The characterization of the size of flowers of this species and of *O. Bejariense* in the Synoptical Flora is not correct and needs revision. The western and southwestern forms of *O. Carolinianum* have corollas as described for the other species, viz, 6-8 lines long, with lobes $\frac{1}{2}$ the length of tube.

Cuscuta decora¹ Engelm. Colbert. On dry prairies, growing preferably on *Cassia Chamæcrista*. June. No. 21.

Cuscuta decora¹ Engelm., var. **indecora** Engelm. On limestone hills near Stone wall. July. No. 134.

SOLANACEÆ.

Solanum Carolinense L. Colbert. Common along railroads east and on prairies west. June. No. 107.

Solanum elæagnifolium Cav. Colbert. Same distribution as **S. Carolinense**. June. No. 108.

SCROPHULARINEÆ.

Conoclea multifida Benth. Boggy places in high prairies west of Paul's Valley. July. No. 147.

Herpestis rotundifolia Pursh. In a pool on the rocky summit of the mountain near Quanah's ranch. July. No. 227.

Buchnera Americana L. Colbert. Prairies. Common. June. No. 4.

Gerardia grandiflora Benth. Sans Bois Mountains. Rocky hills. Frequent throughout Choctaw Nation. August. No. 325.

PEDALINEÆ.

Martynia proboscidea Glox. Wichita River. Low, sandy prairies. This plant appears as if introduced. July. No. 150.

ACANTHACEÆ.

Ruellia ciliosa Pursh, var. **longiflora** Gray. Colbert. Common on dry prairies. June. No. 14.

Dianthera Americana L. McAlester. Muddy creek banks. June. No. 80.

VERBENACEÆ.

Lippia lanceolata Mx. Wichita River, near Anadarko and Fort Sill. Wet banks of creeks. July, August. Nos. 166, 262.

Verbena angustifolia Mx. Caddo. Dry, gravelly hills. Frequent. June. No. 49.

Verbena Aubletia L. Colbert. Common along railroads, especially westward. June. No. 26.

Verbena bipinnatifida Nutt. Caddo. Dry prairies. Common east. June. No. 43.

Verbena officinalis L. Colbert. Prairies. Infrequent. June. No. 23.

LABIATÆ.

Pycnanthemum linifolium Pursh. Atoka. Frequent in low ground. East. June. No. 64.

Hedeoma Drummondii Benth. Stonewall. Limestone hill. July. No. 137.

Salvia farinacea Benth. Sans Bois Mountains. Common in gravelly soil throughout. August. No. 317.

Monarda punctata L. Colbert. Roadsides and prairies. Abundant eastward. The form with white bracts is invariably larger. June. No. 110.

Monarda citriodora Cerv. Colbert. Common on dry prairies. June. No. 25.

Monarda fistulosa L. McAlester. Low ground. July. No. 121.

Monarda Russelliana Nutt. A slender form. Couch's Mills, Sans Bois Mountains. In rocky pine woods. July. No. 98.

Scutellaria versicolor Nutt. Colbert, Caddo, Sans Bois Mountains, and as far west as the western boundary of Chickasaw Nation. June, July. Nos. 6, 47, 97.

¹ I am aware that Choisy's original specific name, altered by Engelmann, should be restored. But the uncertainty as to Choisy's plant being type of Engelmann's *C. decora*, or of his var. *indecora*, has led me for the present to retain here the old names.

PLANTAGINEÆ.

- Plantago Patagonica* Jacq. Colbert. Common on dry prairies. June. No. 111.
Plantago Patagonica Jacq., var. *aristata* Gray. Colbert. Prairies. The commonest form eastward. June. No. 113.

NYCTAGINEÆ.

- Oxybaphus angustifolius* Sweet. Anadarko. Dry prairies. Occasional west of the Chickasaw Nation. July. No. 178.
Oxybaphus hirsutus Sweet. Fort Sill. Roadsides. Not frequent. July. No. 245.
Oxybaphus nyctagineus Sweet, var. *oblongifolius* Gray. Quanah's ranch. Occasional. July. No. 226.

ILLECEBRACEÆ.

- Paronychia dichotoma* Nutt. Rocky and gravelly prairies west of Paul's Valley. Common from there westward. July. No. 151.

AMARANTACEÆ.

- Gossypianthus tenuiflorus* Hook. Prairie-dog town, near Cash Creek. July. No. 170.
Froelichia gracilis Moq. Erin Springs. A prostrate, spreading plant, in sandy soil along borders of thickets. Occasional westward. July. No. 158.
Froelichia gracilis Moq., var. *Floridana*.¹ Dry open thickets west of Erin Springs. Common westward. July. No. 175.

CHENOPODIACEÆ.

- Cycloloma platyphyllum* Moq. Sandy thickets near Erin Springs. July. No. 157.
Chenopodium Boscianum Moq. Creek bottom, near Mount Scott. August. No. 254.

POLYGONACEÆ.

- Polygonum Virginianum* L. Mount Scott. Rich soil, in creek bottoms. Scarce. August. No. 255.

LAURINEÆ.

- Sassafras officinale* Nees. Sans Bois Mountains. Common along creeks and rivers, in Choctaw Nation. August. No. 309.

LORANTHACEÆ.

- Phoradendron flavescens* Nutt. On elms, along Sans Bois Mountains. Common, especially eastward in Choctaw Nation. August. No. 324.

EUPHORBIACEÆ.

- Euphorbia dictyosperma* Fisch. and Mey. Colbert and Caddo. Rich, black, mucky soil, in shade, along creeks, and on low ground on prairies. June. Nos. 15, 40.
Euphorbia longicuris Scheele. Caddo. Dry gravelly hills. June. No. 39.
Euphorbia serpyllifolia Pers., var. *Neo-Mexicana* Millsp. Gravelly hills near Fort Sill. July. No. 185.
Euphorbia zygophylloides Boiss. Quanah's ranch. July. No. 212.

¹ See note on pages 214 and 215.

- Phyllanthus Carolinensis** Walt. Rocky hills near Quanah's ranch. Common there, but not seen westward. July. No. 235.
- Phyllanthus polygonoides** Spreng. Quanah Mountain. Common on sandy and rocky slopes. July. No. 201.
- Phyllanthus Niruri** L.,¹ var. *tenuicaulis* Muell. Quanah's ranch. Low, sandy ground. July. No. 218.
- Jatropha Texana** C. Muell. Erin Springs. Frequent along banks and in thickets throughout the western part, from Paul's Valley to Wichita Mountains. July. No. 156.
- Croton glandulosus** L. Quanah's ranch. Common, especially westward. July. No. 217.
- Croton Lindheimerianus** Scheele. Gravelly roadsides near Gaines Creek. Common east. August. No. 301.
- Croton monanthogynus** Mx. Fort Sill. Abundant throughout, along roadsides and waste places. August. No. 271.
- Croton Texensis** Muell. Fort Sill. Common, especially westward, with the last. August. No. 272.
- Argythamnia mercurialina** Muell. Caddo. Rocky hills. June. No. 54.
- Acalypha Caroliniana** Ell. Quanah's ranch. Sandy Creek banks. Common, especially westward. July. No. 216.
- Tragia stylaris** Muell. Stonewall. Gravelly limestone hills. Not seen elsewhere. July. No. 139.
- Tragia urticæfolia** Mx. Prairies near Fort Sill. July. No. 160.
- Stillingia sylvatica** L. Colbert. Low prairies. Abundant eastward. Infrequent west of Chickasaw Nation. June. No. 27.

URTICACEÆ.

- Celtis Mississippiensis** Bosc. McAlester. On low ground along stream. June. Nos. 78, 79.

Mr. Sheldon sent in the two numbers under the same date and from the same locality, with the note that No. 78 has leaves larger and lighter colored and the fruit nearly twice the size of 79. Both fruits are not yet mature. And it is possible to account for the difference in size of leaves and fruit on the ground of difference of subsoil on which the trees stand, etc. At any rate our present state of knowledge of the two forms does not seem to warrant us in making anything more of these two numbers than simply *Celtis Mississippiensis*.

CUPULIFERÆ.

- Quercus aquatica** Walter. Sans Bois Mountains. Along streams. Common throughout. August. No. 306.
- Quercus coccinea** Wang. Shawnee Hills. Abundant along streams throughout the eastern Territory. August. No. 287.
- Quercus macrocarpa** Mx. Gaines Creek, Sans Bois Mountains. August. No. 302.
- Quercus nigra** L. Sans Bois Mountains. Common throughout in rocky and gravelly regions. August. No. 305.
- Quercus stellata** Wang. Stringtown, Shawnee Hills, and Sans Bois Mountains. Abundant on rocky hills. June to August. Nos. 69, 288, 303.

ORCHIDÆÆ.

- Spiranthes cernua** Richard. Atoka. Generally in sandy soil in low ground. Growing 1-1½ feet high. June. No. 62.

¹ See note on pages 214 and 215.

ZINGIBERACEÆ.

Thalia dealbata Roscoe. Sans Bois Mountains. July. No. 90.

This plant has only the inflorescence "dusted over with powder." Further, Mr. Sheldon reports this as 7-10 feet high, when, according to Chapman, p. 465, it is usually only 3-5 feet high. There are two other specimens of this species in the National Herbarium, Dr. Bigelow's Rio Grande plant, collected in 1853 near the Choctaw Agency, and Elihu Hall's Texan plant No. 629. Hall's plant, however, differs from Bigelow's and Sheldon's in that it has a ring or beard of hairs on the rachis at the base of each flower, while the others are glabrous at that point. Some close field work is necessary to reconcile and explain these discrepancies.

AMARYLLIDÆÆ.

Cooperia Drummondii Herb. Quanah Mountain. In wet, sandy soil among rocks. July. No. 186.

Agave Virginica L. In rich, sandy woods, near Stringtown. June. No. 75.

PONTEDERIACEÆ.

Heteranthera limosa Vahl. In shallow water and pond borders near Fort Sill. August. No. 257.

COMMELINACEÆ.

Commelina Virginica L. Along the banks of Cash and Medicine Creeks, Fort Sill. July. Nos. 159, 184.

JUNCACEÆ.

Juncus acuminatus Mx. McAlester. Borders of shallow streams. June. No. 83.

Juncus Engelmanni Buchenau. Atoka. Low, wet ground. June. No. 66.

Juncus marginatus Rostk. Colbert. Common on low prairies. June. Nos. 36, 37.

Juncus tenuis Willd. Colbert. With the last. June. No. 35.

CYPERACEÆ.

Cyperus acuminatus Torr. Colbert. In wet situations. Abundant east. June. No. 32.

Cyperus aristatus Rottb. Quanah Mountain. In wet sand in the shade of rocks. July. No. 199.

Cyperus filiculmis Vahl. Common on prairies along Cash Creek. July. No. 163.

Cyperus Hallii Brit. Along creek banks west of Stonewall. July. No. 145.

Cyperus ovularis Torr. Colbert. Everywhere. In dry soil. June. No. 116.

Cyperus Schweinitzii Torr. Colbert. Common in dry, sandy soil. June. No. 34.

Eleocharis ovata R. Br. Pond borders near Fort Sill. August. No. 256.

Fimbristylis capillaris Gray. On a rocky hill near Quanah's ranch. July. No. 242.

Fuirena squarrosa Mx., var. *hispida* Chapm. Low ground near Atoka. June. No. 63.

Rhynchospora cymosa Nutt. Banks of Sans Bois Creek. July. No. 94.

Rhynchospora macrostachya Torr. McAlester. Frequent throughout, along muddy banks of streams. June. No. 82.

- Soleria pauciflora** Muhl., var. **Elliottii** Wood. Colbert. Low ground on prairies. Not common. June. No. 16.
Carex lupulina Muhl. Banks of Sans Bois Creek. July. No. 95.
Carex lurida Wahl. With the last. July. No. 96.

GRAMINEÆ.

- Tripsacum dactyloides** L. Prairies along Cash Creek near Fort Sill. July. No. 162.
Andropogon provincialis Lam. Rocky woods near Hartshorn. Common everywhere. September. No. 347.
Andropogon saccharoides Swartz. Chickasaw Nation, and near Fort Sill along banks of Cash Creek. Common throughout. July. Nos. 130, 179.
Andropogon scoparius Mx. Rocky woods in Sans Bois Mountains. Not collected elsewhere. August. No. 331.
Paspalum Floridanum Mx. Rich soil along streams in Sans Bois Mountains. August. No. 276.
Paspalum læve Mx., var. **angustifolium** Vasey. Shawnee Hills. Low ground along creeks. August. No. 284.
Panicum agrostoides Muhl. Low ground along Gaines Creek and wet borders of small lake near McAlester. Common east. August. Nos. 279, 290.
Panicum anceps Mx. Low ground on Gaines Creek. Common east. August. No. 278.
Panicum capillare L. Quanah Mountain. Common in rocky hills in rich loamy soil. July. No. 188.
Panicum filiforme L. Sans Bois Mountains. Clay and gravelly soil. August. Nos. 327, 334.
Panicum hians Ell. McAlester to Stonewall. Frequent. July. No. 127.
Panicum sanguinale L. Gravelly soil in Shawnee Hills. Common east. August. No. 285.
Panicum virgatum L. Fort Sill and Shawnee Hills. Common throughout, along streams and on rocky open slopes. August. Nos. 274, 283.
Panicum viscidum Ell. Atoka. Low ground. Infrequent. June. No. 65.
Cenchrus tribuloides L. Colbert. Throughout, on sandy prairies. Known as "sand burs" or "grass burs." June. No. 33.
Aristida dichotoma L. Gravelly woods in Sans Bois Mountains. The only locality noted. August. No. 335.
Aristida oligantha Mx. Quanah's ranch. Gravelly open woods near creek banks. July. Nos. 202, 223, 266.
Aristida purpurea Nutt., var. **Fendleri** Vasey. Gravelly limestone hill west of Stonewall. July. No. 136.
Aristida purpurea Nutt., var. **Hookeri** Trin. Fort Sill. This is the characteristic grass in prairie-dog towns. July. No. 182.
Muhlenbergia glomerata Trin. Rocky hills near Quanah's ranch. Common in Wichita Mountains. July. No. 238.
Muhlenbergia glomerata Trin., var. **ramosa** Vasey. The commonest grass, on rocky slopes. August. No. 251.
Cinna arundinacea L. Common on low ground in Sans Bois Mountains. August. No. 291.
Buchloë dactyloides Engelm. Cash Creek and Fort Sill. Usually found in prairie-dog towns. July. Nos. 164, 180.
Bouteloua hirsuta Lag. Dry prairies near Fort Sill. Much more frequent than Buffalo grass, and with a similar range. July. No. 181.
Bouteloua racemosa Lag. In gravelly soil near Stonewall. July. No. 129.
Triodia cuprea Jacq. Creek banks, near Fort Sill. Infrequent there, but common eastward. August. No. 270.

- Triodia cuprea** Jacq., var. **intermedia** Vasey, n. var. ined. Along the banks of streams near Fort Sill. August. No. 273.
- Triodia Texana** Watson. Hartshorn. Open pine woods. September. No. 340.
- Eragrostis capillaris** Link. Quanah's ranch and Sans Bois Mountains. Sandy soil in low ground along streams. July, August. Nos. 207, 281.
- Eragrostis oxylepis** Torr. Hartshorn. Open pine woods. September. No. 340.
- Eragrostis pectinacea** Gray. Hartshorn. Rocky woods. September. No. 336.
- Eragrostis Purshii** Schrad. Quanah's ranch. Common. July. No. 206.
- Diarrhena Americana** Beauv. Sans Bois Mountains and McAlester. July, August. Nos. 119, 286.
- Uniola gracilis** Mx. Sans Bois Mountains. Low rich ground along streams, August. No. 277.
- Uniola latifolia** Mx. McAlester. Creek banks. Common throughout. June. No. 84.
- Festuca tenella** Willd. Quanah Mountain. In rocky soil. July. No. 190.
- Agropyrum repens** L. Stonewall to Paul's Valley. Open woods. Infrequent. July. No. 142.
- Agropyrum tenerum** Vasey. Anadarko. Low prairies along Washita River. Abundant. July. No. 165.
- Elymus Virginicus** L. Open woods between Stonewall and Paul's Valley; also on summit of Mount Scott and near Fort Sill. July, August. Nos. 143, 252.

CONIFERÆ.

- Juniperus Virginiana** L. Rocky hills near Stonewall. Especially common in Wichita Mountains. July. No. 265.

EQUISETACEÆ.

- Equisetum robustum** Braun. Between McAlester and Stonewall. Around a spring, on a muddy, boggy creek. July. No. 140.

FILICES.

- Cheilanthes tomentosa** Link. Quanah Mountain. Common in shade of rocks. July. No. 194.
- Cheilanthes tomentosa** Link, var. **Eatoni** Dav. Quanah's ranch. Rocky places. July. Nos. 193, 234.
- Cheilanthes vestita** Swartz. Wichita Mountains. Infrequent. July. No. 211.
- Pellæa atropurpurea** Link. Ravines near the summit of Quanah Mountain. July. No. 195.
- Pellæa ternifolia** Link. Quanah Mountain. Wet sand, in shade of rocks. July. No. 192.
- Asplenium Trichomanes** L. Rocky hills near Quanah's ranch. Frequent. July. No. 239.
- Aspidium marginale** Swartz. In crevices of rocks on Quanah Mountain. July. Nos. 196, 241.

SELAGINELLACEÆ.

- Selaginella rupestris** Spring. Quanah Mountain. In wet sand. Frequent. July. No. 233.

II.—M. A. CARLETON'S COLLECTION.

Mr. Carleton started in at Vinita. From there he went westward through the Creek and Seminole nations, Oklahoma, the Cheyenne country, the southern tiers of counties in Kansas (April to July). Then he went through the Cimarron Valley, Neutral Strip, into the north-western counties of Texas, returning through the Indian Territory into Kansas (August, September).

RANUNCULACEÆ.

- Anemonella thalictroides* Spach. Vinita. Wooded hills. April. No. 40.
Ranunculus abortivus L., var. *micranthus* Gray. Muscogee. Woods. April. No. 75.
Ranunculus fascicularis Muhl. Vinita. Prairies. April. No. 9.
Ranunculus septentrionalis Poir. Vinita. Woods. April. No. 29.

MENISPERMACEÆ.

- Cocculus Carolinus* D. C. Logan County, Okla. August. No. 474.

FUMARIACEÆ.

- Corydalis aurea* Willd. Vinita. Stony hills. April. No. 35.
Corydalis micrantha Gray. Muscogee. Stony Point. April. No. 49.

CRUCIFERÆ.

- Nasturtium sphærocarpum* Gray. Ford County, Kans. Shore of a lake. July. No. 325.
Streptanthus hyacinthoides Hook. North Canadian River, Cherokee Outlet. June. No. 203.
 Contr. Nat. Herb. ii. 19, reads: "One pair of the longer filaments connate."
 It should read: "The four longer filaments connate in pairs."
Cardamine hirsuta L., var. *sylvatica* Gaud. Vinita. Prairies. April. No. 11.
Selenia aurea Nutt. Vinita. Prairies. April. No. 8.
Lesquerella gracilis Watson. Cimarron Valley, Cherokee Outlet. Gypsum hills. June. No. 214.
Draba cuneifolia Nutt. Vinita. Woods. April. No. 39.
Erysimum asperum DC. Ford County, Kans. July. No. 319.
Biscutella Wislizeni Benth. and Hook. Moore County, Tex.; also, Comanche County, Kans. August. Nos. 419, 231.

CAPPARIDEÆ.

- Cleome integrifolia* Torr. and Gray. Ford County, Kans. July. No. 324.
Polanisia trachysperma Torr. and Gray. Cimarron Valley. June. No. 232.

CISTINEÆ.

- Lechea tenuifolia* Mx. Stafford County, Kans. In road wastes. July. No. 299.

VIOLARIEÆ.

- Viola palmata* L. Vinita. April. No. 25.
Viola pedata L. Vinita. April. No. 37.
Viola pubescens Ait., var. *scabriuscula* Torr. and Gray. Vinita. April. No. 2.
Ionidium polygalæfolium Vent. Cheyenne country. June. No. 193.

POLYGALÆ.

- Polygala verticillata* L. Reno County, Kans. Alkali spots. July. No. 286.
Krameria secundiflora DC. Oklahoma; also Morton County, Kans. July. No. 173.

CARYOPHYLLÆ.

- Silene antirrhina* L. Guthrie, Okla. May. No. 145.
Cerastium nutans Raf. Vinita. Prairies. April. No. 10.

This plant is doubtfully referred here as a small form of this species. Its reflexed pedicels are longer than the sepals, as are the petals. It is the same as Jermy's No. 134 from Gillespie County, Tex., and Dr. Palmer's No. 30, collected in the Indian Territory in 1868. This form, so far as the three collections show, grows only 3 to 5 inches high. The younger plants are simple, erect, with 3 to 5 pairs of leaves below the branching inflorescence, while the older plants branch at the base.

- Stellaria Nuttallii* Torr. and Gray. Okmulgee. Woods. April. No. 96.
Arenaria Pitcheri Nutt. Muscogee. April. No. 69.
Sagina decumbens Torr. and Gray. Vinita. Prairies. April. No. 12.

PORTULACÆ.

- Portulaca pilosa* L. Dallas County, Tex; August. No. 399.
Talinum calycinum Engelm.¹ Cheyenne country. June. No. 185.
Talinum parviflorum Nutt. Hartley County, Tex. In sand. August. No. 403.
Claytonia Virginica L. Vinita. April. No. 1.

MALVACÆ.

- Callirrhoe involucrata* Gray. Neutral Strip; North Canadian River. August. No. 338.
Callirrhoe pedata Gray. Cimarron Valley. June. No. 226.
Malvastrum angustum Gray. Reno County, Kans. July. No. 288.
Malvastrum coccineum Gray. Comanche County, Kans. June. No. 238.
Hibiscus lasiocarpus Cav. Hemphill and Moore counties, Tex. August. Nos. 426, 436.

LINEÆ.

- Linum Berlandieri* Hook. Oklahoma City. May. No. 128.
Linum perenne L., var. *Lewisii* Eaton and Wright. Cheyenne country. June. No. 192.
Linum sulcatum Riddell. Black Bear Creek, Cherokee Outlet. September. No. 481.

ZYGOPHYLLÆ.

- Tribulus maximus* L. Upper Cimarron. Becoming a noxious weed in cultivated ground. July. No. 362.

¹ This species and *T. teretifolium* look very much alike. When in flower they can be separated by the number of stamens, *T. calycinum* having 30, *T. teretifolium* 20. In fruit the separation is more difficult. The only tangible distinction that I could make out is in the duration of the sepals, which fall with the corolla in *T. teretifolium*, but are somewhat persistent after the corolla falls in *T. calycinum*. The sepals are also produced below the point of insertion in *T. calycinum* and not produced in *T. teretifolium*. Coherently stated, the matter stands thus:

1. *Talinum calycinum* has 30 or more stamens, has sepals persistent after the corolla falls, and has them produced below the point of insertion.

2. *Talinum teretifolium* has 20 stamens; its sepals fall with the corolla and are not produced below the point of insertion.

RUTACEÆ.

- Xanthoxylum Americanum** Mill. Vinita. Woods. April. No. 16.
Ptelea trifoliata L., var. *mollis* Torr. and Gray. Cheyenne country. June. No. 196.

ILICINEÆ.

- Ilex decidua** Walt. Muscogee. Arkansas River. April. No. 71.

AMPELIDACEÆ.

- Vitis Arizonica** Engelm. Cimarron Valley. June. No. 234.

SAPINDACEÆ.

- Sapindus marginatus** Willd. Barber County, Kans. June. No. 257.

STAPHYLEACEÆ.

- Staphylæa trifolia** L. Vinita. April. No. 31.

ANACARDIACEÆ.

- Rhus Toxicodendron** L. Guthrie. Woods. May. No. 146.

LEGUMINOSÆ.

- Trifolium Carolinianum** Mx. Okmulgee. Woods. April. No. 88.
Trifolium reflexum L. Southern Seminole Nation. May. No. 114.
Psoralea campestris Nutt. Kingfisher, Okla. June. No. 181.
Psoralea cuspidata Pursh. Oklahoma; also Reno County, Kans. July. No. 178.
Psoralea esculenta Pursh. Sacred Heart Mission. May. No. 112.
Psoralea lanceolata Pursh. Guthrie, Cimarron Valley and Cherokee Outlet. May, June. No. 151.
Dalea alopecuroides Willd. Comanche County, Kans. September. No. 515.
Dalea lanata Spreng. Cimarron Valley, Neutral Strip. July. No. 356.
Dalea nana Torr. Seward and Stevens counties, Kans. In sand. July. No. 333.
Petalostemon gracilis Nutt. Cimarron Cañon, Neutral Strip. August. No. 369.
Petalostemon violaceus Mx. Stafford and Morton counties, Kans. July. No. 307.
Petalostemon violaceus Mx., var. *tenuis* Coulter. With the preceding.
Petalostemon villosus Nutt. Reno County, Kans. Shady districts. July. No. 291.
Indigofera leptosepala Nutt. Guthrie; Cimarron Valley; Cherokee Outlet. May, June. No. 152.
Tephrosia Virginiana Pers. Oklahoma. June. No. 172.
Astragalus caryocarpus Ker. Cheyenne country. June. No. 202.
Astragalus distortus Torr. and Gray. Vinita. Prairies. April. No. 30.
Astragalus leptocarpus Torr. and Gray. We-wo-ka, Seminole Nation. May. No. 101a.
Astragalus lotiflorus Hook. Guthrie. Sand hills. May. No. 139.
Astragalus lotiflorus Hook., var. *brachypus* Gray. Cimarron Valley; also Pawnee and Ford counties, Kans. June, July. Nos. 227, 314.
Astragalus Mexicanus DC. Vinita. April. No. 38.
Astragalus microlobus Gray. Cimarron Valley; Cherokee Outlet. June. No. 218.
Astragalus mollissimus Torr. Cheyenne country. June. No. 190.
Astragalus Nuttalianus DC. We-wo-ka, Seminole Nation. May. No. 101. Fruit at Guthrie.
Astragalus procumbens Watson. Guthrie and Oklahoma City, Oklahoma. May, Nos. 125, 140.
Astragalus racemosus Pursh. Cimarron Valley; Cherokee Outlet. June. No. 221.

- Oxytropis Lamberti** Pursh. Southern Seminole Nation; also Cimarron Valley. May, June. Nos. 116, 217.
- Desmodium Canadense** DC. Hemphill County, Tex. August. No. 432.
- Desmodium Illinoense** Gray. Harper County, Kans. August. No. 269.
- Desmodium paniculatum** DC. Logan County, Okla. August. No. 468.
- Desmodium sessilifolium** Torr. and Gray. Cantonment, Okla. Black jack forest. August. No. 456.
- Lespedeza capitata** Mx. North Canadian River, Cherokee Outlet. August. No. 444.
- Lespedeza procumbens** Mx. Cimarron River; Logan County, Okla. August. No. 475.
- Lespedeza reticulata** Pers. North Canadian River, Cherokee Outlet. August. No. 445.
- Vicia Americana** Mühl. Guthrie. Cimarron Valley. May, June. No. 153.
- Vicia exigua** Nutt. We-wo-ka, Seminole Nation. May. No. 102.
- Vicia Reverchoni** Watson. We-wo-ka, Seminole Nation. May. No. 99.
- Lathyrus ornatus** Nutt. Guthrie, Okla. May. No. 106.
- Lathyrus pusillus** Ell. Muscogee and We-wo-ka, Seminole Nation. April. No. 61.
- Amphicarpæa monoica** Nutt. Arkansas City, Kans. September. No. 484.
- Phaseolus diversifolius** Pers. Logan County, Okla. August. No. 466.
- Phaseolus helvolus** L. Reno and Stafford counties, Kans. July. No. 297.
- Phaseolus pauciflorus** Benth. North Canadian River, Cherokee Outlet. August. Nos. 447, 448.
- Sophora sericea** Nutt. Oklahoma City, Okla. May. No. 124.
- Hoffmanseggia Jamesii** Torr. and Gray. Cimarron Valley, Cherokee Outlet; also Dodge City, Kans. July. No. 229.
- Hoffmanseggia stricta** Benth. Cimarron cañon, Neutral Strip. August. No. 386.
- Cassia Marilandica** L. Logan County, Okla. August. No. 473.
- Prosopis juliflora** DC. Canadian cañons, Oldham County, Tex. August. No. 412.
- Desmanthus Jamesii** Torr. and Gray. Upper Cimarron cañons; also Dallas, Tex. July. No. 359.
- Mimosa borealis** Gray. Cimarron valley, Neutral Strip. On bluffs of red sandstone. July. No. 359.
- Acacia filicina** Willd. Kingfisher County, Okla. August. No. 458.

ROSACEÆ.

- Prunus Americana** Marsh. Vinita. Woods. April. No. 6.
- Prunus gracilis** Engelm. and Gray. North Canadian River, Cherokee Outlet. April. Fruit in June. Nos. 13, 205.
- Prunus serotina** Ehrh. Vinita. Woods. April. No. 5.
- Rubus Canadensis** L. We-wo-ka, Seminole Nation. May. No. 105.
- Rubus trivialis** Mx. Vinita. Prairies. April. No. 18.
- Geum vernum** Torr. and Gray. Vinita. Woods. April. No. 17.
- Fragaria vesca** L. Vinita. Woods. April. No. 34.
- Potentilla Canadensis** L. Vinita. Prairies. April. No. 36.
- Agrimonia parviflora** Ait. Hemphill County, Tex. August. No. 431.
- Poterium annuum** Nutt. Oklahoma. July. No. 175.
- Rosa Arkansana** Porter. Comanche County, Kans. June. No. 254.
- Cratægus arborescens** Ell. Muscogee, Arkansas River. April. No. 73.
- Cratægus coccinea** L., var. *mollis* Torr. and Gray. Vinita. Woods. April. No. 14.

HALORAGÆÆ.

- Callitriche heterophylla** Pursh. Vinita. April. No. 27.

LYTHRARIÆÆ.

- Ammannia coccinea** Rottb. Salt plain of the Salt Fork, Cherokee Outlet, S. E. Kiowa, Kansas. September. No. 586.

ONAGRARIÆ.

- Jussiaea repens** L. Sumner County, Kans., on Territory line. Aquatic. September. No. 500.
- Gaura biennis** L. Cherokee Outlet, near Arkansas City. September. No. 480.
- Gaura coccinea** Nutt. Seward and Stevens counties, Kans. July. No. 334.
- Gaura Nealleyi** Coulter. Oklahoma City, Okla. May. No. 129.
- Gaura sinuata** Nutt. Guthrie and Oklahoma City, Okla. May. Nos. 122, 142.
- Gaura villosa** Torr. Guthrie, Cimarron Valley. May. No. 155.
- Oenothera albicaulis** Nutt. Neutral Strip and Beaver County, Okla. July. No. 354.
- Oenothera biennis** L. Stafford County, Kans.; Cimarron cañons; Neutral Strip. July. No. 309.
- Oenothera canescens** Torr. Ford County, Kans. July. No. 326.
- Oenothera Hartwegi** Benth. Clark County, Kans.; Cherokee Outlet Cheyenne country. June, July. Nos. 200, 204.
- Oenothera linifolia** Nutt. Muscogee. April. No. 53.
- Oenothera Missouriensis** Sims. Pottawatomie and Cheyenne counties; also Sumner County, Kans. May, June. Nos. 117, 272.
- Oenothera pinnatifida** Nutt. Stevens County, Kans. July. No. 344.
- Oenothera serrulata** Nutt. Morton County, Kans. July. No. 350.
- Oenothera sinuata** L. Oklahoma City, Okla. May. No. 127.
- Oenothera sinuata** L. var. **grandiflora** Watson. Edwards County, Kans. July. No. 308.
- Oenothera sinuata** L., var. **minima** Nutt. Okmulgee. Woods. April. No. 95.
- Oenothera Spachiana** Torr. and Gray. Sacred Heart Mission. Country of the Pottawatomies. May. No. 111.
- Oenothera speciosa** Nutt. Muscogee; Arkansas River. April. No. 74.
- Oenothera triloba** Nutt. Reno County, Kans. July. No. 289.

LOASEÆ.

- Mentzelia multiflora** Gray. Cimarron cañons, Neutral Strip. August. No. 378.
- Mentzelia nuda** Torr. and Gray. Gray County, Kans. July. No. 328.
- Mentzelia oligosperma** Nutt. Cimarron cañons, Neutral Strip. June. No. 216.

CUCURBITACEÆ.

- Cyclanthera dissecta** Arn. Cimarron cañons, Neutral Strip. August. No. 375.

CACTEÆ.

- Mamillaria dasyacantha** Engelm. Kingman County, Kans. September. No. 551.
- Mamillaria vivipara** Haworth. Meade County, Kans. September. No. 530.
- This is the form called var. *radiosa* Engelm., and *M. radiosa*, var. *Neo-Mexicana* Engelm. Nos. 120, 233, from near Oklahoma City and Cherokee Outlet, respectively, are other forms of the same species.
- Opuntia arborescens** Engelm. Neutral Strip. Rocky mesas. July. No. 358.
- Opuntia leptocaulis** D C. Oldham County, Tex. August. No. 410.
- Opuntia Missouriensis** DC. Gray County, Kans. July. No. 329.
- Probably this species. There was not enough material to determine it with certainty.

FICOIDEÆ.

- Sesuvium Portulacastrum** L. Cherokee Outlet. Great Salt Plains. July. No. 230.

UMBELLIFERÆ.

Eryngium diffusum Torr. Cheyenne and Arapahoe countries; Salt Fork, Cherokee Outlet. Comparatively rare. August. No. 454.

Berula angustifolia Koch. Reno County, Kans. July. No. 294.

Chærophylloides procumbens Crantz. Big Cabin Creek and Muscogee. April. Nos. 4, 68.

Polytænia Nuttallii DC. Muscogee. April. No. 56.

CORNACEÆ.

Cornus florida L. Okmulkee. Woods. April. No. 93.

CAPRIFOLIACEÆ.

Viburnum prunifolium L. Vinita and Muscogee. Woods. April. No. 44.

RUBIACEÆ.

Houstonia patens Ell. Vinita. April. No. 3.

Galium virgatum Nutt. Oklahoma City, Okla. May. No. 133.

VALERIANACEÆ.

Valerianella Nuttallii Walp. Vinita. April. No. 23.

No. 51 was another *Valerianella* not sufficiently developed for specific determination.

COMPOSITÆ.

Vernonia Jamesii Torr. and Gray. Cimarron Valley, Neutral Strip. July. No. 355.

Elephantopus Carolinianus Willd. Logan County, Okla. August. No. 462.

Eupatorium celestinum L. Logan County, Okla. August. No. 465.

Eupatorium hyssopifolium L. Kansas City, Kans. September. No. 493.

Eupatorium serotinum Mx. Logan County, Okla., and Ponca Agency. August. No. 463.

Liatis punctata Hook. Morton County, Kans.; Cherokee Outlet. July, August. Nos. 353, 437.

Liatis squarrosa Willd. Reno and Morton counties, Kans. July. No. 290.

Gutierrezia Euthamiæ Torr. and Gray. Morton County, Kans. July. No. 346.

Amphiachyris dracunculoides Nutt. North Canadian River, Cherokee Outlet. August. No. 451.

Grindelia squarrosa Dunal. Meade County, Kans. September. No. 538.

Grindelia squarrosa Dunal, var. *grandiflora* Gray. North Canadian River, Cherokee Outlet. August. No. 449.

Heterotheca Lamarckii Cass. Hemphill County, Tex., and Cherokee Outlet. August. No. 438.

Chrysopsis pilosa Nutt. Cimarron Valley, Cherokee Outlet. June. No. 215.

Chrysopsis villosa Nutt., var. *canescens* Gray. Logan County, Okla. August. No. 469.

Aplopappus divaricatus Gray. Reno County, Kans.; Texas line of Cherokee Outlet. July. No. 292.

Aplopappus rubiginosus Torr. and Gray. Hemphill County, Tex.; Cherokee Outlet, near Salt Fork of Cimarron River. September. Nos. 435, 504.

Aplopappus spinulosus DC. Oldham County, Tex. In sand. August. Nos. 411, 416.

Bigelovia Wrightii Gray. Oldham County, Tex. August. No. 408.

Solidago leptcephala Torr. and Gray. Canadian River, Hutchinson County, Tex. August. No. 427.

- Solidago Missouriensis** Nutt. Small form. Ford County, Kans. July. No. 313.
- Solidago Missouriensis** Nutt., var. *fasciculata*, Holzinger, n. var. One to 2 feet high; leaves narrower than in the species, becoming linear upward; in axils of upper leaves, shortened branches in the form of fascicles of linear leaves. Hemphill County, Texas, and Cherokee Outlet, near Arkansas City [No. 430], to Missouri (Blankenship). Intergrades with the species occur as far east as Illinois.
- Solidago nemoralis** Ait. Cherokee Outlet, on Guthrie and Arkansas City trail. September. No. 478.
- Solidago radula** Nutt. Clayton, N. Mex.; Barber County, Kans.; Cherokee Outlet. August and September. Nos. 393, 446.
- Solidago ulmifolia** Mühl. On Walnut River, Arkansas City, Kans. September. No. 482.
- Aphanostephus Arkansanus** Gray. Guthrie. May. No. 165.
- Bellis integrifolia** Mx. Muscogee. April. No. 70.
- Townsendia grandiflora** Nutt. In sand. Hartley and Moon counties, Tex. August. No. 407.
- Chætopappa asteroides** DC. Muscogee; Stony Point. April. No. 57.
- Boltonia latisquama** Gray. Sumner County, Kans., near line of Territory. September. No. 499.
- Aster ericæfolius** Roth. Comanche County, Kans.; Hartley County, Tex. June; August. Nos. 239, 406.
- Aster exilis** Ell. Wolf Creek, in Cherokee Outlet, near Texas line. August. No. 440.
- Aster multiflorus** Ait. Kiowa County, Kans. September. No. 540.
- Aster oblongifolius** Nutt., var. *rigidulus* Gray. Salt Creek in Cheyenne and Arapahoe counties; also in Barber and Ford counties, Kans. August and September. Nos. 457, 509, 539.
- Aster patens** Ait. Logan County, Okla. August. No. 476.
- Aster sagittifolius** Willd. Logan County, Okla. August. No. 461.
- Aster tanacetifolius** HBK. Englewood and Ford counties, Kans. July, September. Nos. 323; 526.
- Erigeron divaricatus** Mx. Clark County, Kans. June. No. 242.
- Erigeron divergens** Torr. and Gray. Cherokee Outlet; Arkalon, Kans. June, September. Nos. 209, 535.
- Erigeron Philadelphicus** L. Vinita and Muscogee. April. No. 46.
- Baccharis salicina** Torr. and Gray. Oldham County, Tex. August. No. 414.
- Baccharis Wrightii** Gray. Clark County, Kans. June. No. 241.
- Evax multicaulis** DC. Cheyenne country. June. No. 189.
- Evax prolifera** Nutt. Oklahoma City, Okla. May. No. 132.
- Gnaphalium purpureum** L. Wewoka, Seminole Nation. May. No. 42.
- Melampodium cinereum** DC. Seward County, Kans. July. No. 331.
- Berlandiera lanata** Benth. Morton County, Kans.; also Neutral Strip. July. No. 349.
- Berlandiera Texana** DC. Stevens and Morton counties, Kans.; also Cherokee Outlet. July. Nos. 219, 341.
- Engelmannia pinnatifida** Torr. and Gray. Guthrie and Western Oklahoma. May and June. No. 164.
- Yva xanthiifolia** Nutt. Arkalon, Kans. September. No. 536.
- Franseria discolor** Nutt. Arkalon, Kans. In sand. September. No. 534.
- Franseria tenuifolia** Gray. Clayton, N. Mex. August. No. 390.
- Franseria tomentosa** Gray. Meade County, Kans. Bed of a small marsh. September. No. 527.
- Zinnia grandiflora** Nutt. Comanche County, Kans. June. No. 255.
- Lepachys Tagetes** Gray. Edwards, Seward, and Ford counties, Kans. July. No. 310.

- Rudbeckia amplexicaulis* Vahl. Sumner County, Kans. June. No. 258.
Rudbeckia hirta L. Oklahoma. July. No. 174.
Helianthus ciliaris DC. Panhandle; Moore County, Tex. August. No. 404.
Helianthus giganteus L. North Canadian River. August. No. 453.
Helianthus mollis Lam. Ponca Agency in Cherokee Outlet. September. No. 479.
Helianthus orgyalis DC. Arkansas City, Kans. September. No. 490.
Helianthus rigidus Desf. Kingfisher County, Okla. August. No. 460.
Verbesina virginica L. Cheyenne and Arapahoe counties. August. No. 452.
Coreopsis cardaminefolia Torr. and Gray. Cheyenne country. June. No. 188.
Thelesperma filifolium Gray. Guthrie, and Southern Seminole Nation. May. No. 115.
Bidens cernua L. Pratt County, Kans. September. No. 541.
Riddellia tagetina Nutt.¹ Cheyenne country; Oldham County, Tex. June, August. No. 201.
Hymenopappus flavescens Gray. Seward and Stevens counties, Kans. In sand. July. No. 336.
Bahia oppositifolia Nutt. Moore County, Tex. August. No. 418.
Polypteris Texana Gray. Stevens and Morton counties, Kans.; Cherokee Outlet. In sand. July. No. 340.
Pericome caudata Gray. A quite scabrous form. Rabbit Ear Mountains, Clayton, N. Mex. August. No. 392.
Flaveria angustifolia Pers. Near Salt Fork of Cimarron, Cherokee Outlet. September. No. 505.
Pectis angustifolia Torr. Clayton, N. Mex.; also Arkalon, Kans. August. No. 394.
Helenium autumnale L. Hemphill County, Tex. August. No. 433.
Gaillardia lanceolata Mx. Comanche County, Kans.; also Cimarron Valley. June, August. No. 220.
Gaillardia pinnatifida Torr. Neutral Strip; also Dallas County, Tex. August. No. 380.
Gaillardia pulchella Foug. Canadian City, Tex.; Comanche County, Kans.; Cheyenne country; and Cherokee Outlet. June. Nos. 194, 220.
Gaillardia simplex Scheele. Oklahoma City, Okla. May. No. 119.
Actinella linearifolia Torr. and Gray. Pottawatomie country. May. No. 118.
Actinella odorata Gray. Oldham County, Tex. August. No. 413.
Actinella scaposa Nutt. Morton County, Kans.; also Neutral Strip. July. No. 347.
Artemisia caudata Mx. Meade County, Kans. Sand hills. September. No. 528.
Artemisia filifolia Torr. Barber County, Kans. September. No. 508.
Artemisia Wrightii Gray. Meade County, Kans. September. No. 529.
Senecio aureus L. Vinita. Prairies. April. No. 19.
Senecio Douglasii DC. Cimarron Cañon, Neutral Strip. August. Nos. 370, 381.
Cnicus altissimus Willd. Kingfisher County, Okla. August. No. 459.
Cnicus ochrocentrus Gray. Edwards County, Kans. July. No. 317.
Cnicus undulatus Gray, var. *megacephalus* Gray. Reno County, Kans. July. No. 295.

¹ The line between the groups of *Riddellia* is not well drawn on the size of the rays, as in Gray, Syn. Fl. ii. pt. 1. pp. 317, 318. This plant has the short rays of *R. arachnoidea*, but the glabrous achenes and entire paleæ of the pappus of *R. tagetina*, with which species it is therefore placed.

On examination, the following numbers had to be transferred to *Riddellia tagetina* Nutt.: (1) No. 623 of Mexican Boundary Survey; (2) a plant from New Mexico, sent in 1887 by W. B. Pease; (3) Newberry's plant in McComb's expedition from the "Hills on the Chama;" (4) Letterman's plants, sent in 1882, from Big Springs, Tex.

Dr. Watson, to whom this matter had been referred for counsel, said, in a letter on the subject: "Dr. Gray evidently made too little allowance for variation in the rays of the first group in the genus. In fact, it is only in *R. Cooperi* that the ray reaches the dimensions given. In *R. tagetina* it is anywhere from 2 to 3 lines in length."

Krigia occidentalis Nutt. Guthrie. May. No. 150.

Krigia occidentalis Nutt., var. **mutica** Torr. and Gray. Vinita. Prairies. April. No. 28.

Krigia Virginica Willd. Muscogee. April. No. 62.

Troximon cuspidatum Pursh. Vinita. Prairies. April. No. 32.

Pyrrhopappus scaposus DC. Creek Nation. May. No. 47.

Lactuca acuminata Gray. Arkansas City, Kans. September. No. 495.

Lygodesmia juncea Don. Cimarron Valley; Edwards County, Kans. June, July. Nos. 222, 311.

LOBELIACEÆ.

Lobelia splendens Willd. Cimarron Cañon, Neutral Strip; Moore County, Tex. August. No. 371.

Lobelia syphilitica L. Kingman County, Kans. September. No. 550.

CAMPANULACEÆ.

Specularia leptocarpa Gray. Oklahoma. July. No. 176.

Specularia perfoliata A. DC.¹ Guthrie, Cimarron Valley. May. No. 167.

PRIMULACEÆ.

Samolus ebracteatus HBK. Cimarron Valley, Cherokee Outlet. June. No. 224.

Samolus Valerandi L., var. **Americanus** Gray. Moore County, Tex. August. No. 424.

ASCLEPIADEÆ.

Acerates viridiflora Ell. Comanche County, Kans. June. No. 249.

Asclepias arenaria Torr. Cimarron Valley, Cherokee Outlet. June. No. 235.

Asclepias Jamesii Torr. Ford County, Kans. July. No. 321.

Asclepias incarnata L., var. **longifolia** Gray. Hemphill County, Tex. August. No. 434.

Asclepias stenophylla Gray. Comanche County, Kans. June. No. 248.

Asclepias verticillata L., var. **pumila** Gray. Edwards County, Kans. July. No. 315.

Asclepiodora decumbens Gray. Oklahoma. July. No. 179.

Gonolobus cynanchoides Engelm. Guthrie; also Cimarron Valley, Cherokee Outlet. May. No. 154.

¹ The other specimens of this form of *S. perfoliata* in the National Herbarium are: No. 679, of Mexican Boundary Survey; Dr. Palmer's No. 168, from Indian Territory; and a plant collected by C. Thomas in the Rocky Mountains, in 1869. The Mexican Boundary plant was first named *Dysmicodon ovatum* Nutt., but was subsequently changed to *Specularia biflora* Gray, with a question mark. The other two plants were both found with *Specularia perfoliata*.

The capsules of this form are about $\frac{1}{2}$ longer than in the common form; the seeds, on the other hand, are $\frac{1}{2}$ smaller, and more oval, the ratio of the two diameters being as 3 to 2. *Specularia leptocarpa* has seeds of about this shape, but just double this length. The seeds of *Specularia biflora* the Syn. Fl. ii, 11, describes as lenticular, but on examining some ripe seeds of Reverchon's Texan plant under this name, I find it to be oval, and of about the same size as in the plants under consideration. The characteristic difference between *Specularia perfoliata* and *biflora* is in the leaves, which are broader and more amplexicaule in *S. perfoliata*, narrower and more distant on the stem in *S. biflora*, but still amplexicaule; the length of the capsule varies some in both, so does the position of the valves, certainly in *perfoliata*; the Syn. Fl. ii, 11, places these "at or below the middle," but both the figure in HBK. nov. gen. et sp. iii. t. 265, and the National Herbarium specimens show valves in this species above the middle. The plants under consideration have the valves of the capsules above the middle, but have the leaves of *S. perfoliata*. On the other hand, Mr. F. V. Coville collected a plant in Pennsylvania which has the more slender aspect, in leaves and stem, of *S. biflora*. There is other material in the National Herbarium tending to show that *Specularia perfoliata* and *biflora* are only variations of one good species, variable in width of leaf, length of capsule, and position of valvular openings on the same.



IPOMŒA CARLETONI Holzinger, n. sp.



GENTIANACEÆ.

Sabbatia campestris Nutt. Cheyenne country. June. No. 187.

Eustoma Russellianum Griseb. Morton, Kans.; Neutral Strip. July. No. 345.

The plants collected in Neutral Strip are white-flowered, but otherwise practically like the species. They may, therefore, be known as "*forma alba*" of this species.

POLEMONIACEÆ.

Phlox pilosa L. Guthrie. May. No. 141.

Gilia longiflora Don. Hemphill and Lipscomb counties, Tex. Sand hills. August. No. 428.

Gilia rigidula Benth., var. **acerosa** Gray. Dallas County, Tex. In sandy districts. August. No. 398.

HYDROPHYLLACEÆ.

Phacelia parviflora Pursh. Stony Point; Muscogee. April. No. 50.

Phacelia strictiflora Gray. Stony Point. April. No. 52.

Nama demissum Gray. Cheyenne country. Gypsum hills. June. No. 199.

Nama hispidum Gray. Oklahoma City, Okla. Stony wastes. May. No. 135.

BORAGINEÆ.

Heliotropium convolvulaceum Gray. Stewart and Stevens counties, Kans. July. In sand. No. 338.

Krynitzkia crassisejala Gray. Cherokee Outlet. June. No. 212.

Krynitzkia Jamesii Gray. Comanche County, Kans. June. No. 246.

Myosotis verna Nutt. Muscogee. April. No. 59.

Lithospermum angustifolium Mx. Cherokee Outlet. June. No. 204.

CONVOLVULACEÆ.

Ipomœa coccinea L. Arkansas City, Kans. September. No. 497.

Ipomœa commutata Roem. and Schult. Arkansas City, Kans. September. No. 496.

Ipomœa leptophylla Torr. Larned, Pawnee and Sumner counties, Kans.; Cherokee Outlet. June. No. 228.

Ipomœa Carletoni Holzinger n. sp. A much branched glabrous vine, trailing on the ground; leaves narrowly lanceolate, truncate to acute at base, mucronate at apex, about 2 inches long, exclusive of petiole (one-half to an inch long): flowers 2 to 2½ inches long, generally solitary but occasionally two or three at the end of the common peduncle (1 to 1½ inches long); pedicels little shorter than peduncles: sepals one-half inch long, much imbricated, of unequal length, apex rounded or obtuse and generally mucronulate, glabrous outside, minutely scabrous inside, the outer ones more decidedly so: stamens about ⅔ length of corolla; filaments densely hairy near their point of insertion on corolla: style about ½ length of corolla; stigma rather discoid-peltate than capitate. Mature fruit and root are desiderata to complete the characters.—Logan County, Okla., and Cimarron River, near Guthrie. August. No. 472.

This is near *I. longifolia*, but is more slender, and smaller in all its parts. It is not unlikely that it may turn out to be a small variety of this species, but until fruit and root are observed it is decided not to place it so.

EXPLANATION OF PLATE XVII.—Upper part of a flowering plant; *a*, part of corolla laid open to show insertion of stamens; all parts of natural size, except peduncles and pedicels, which show thicker in the figure than in the plants.

- Convolvulus incanus** Vahl. Morton County, Kans.; Clayton, N. Mex. July. No. 351.
Evolvulus argenteus Pursh. Oklahoma City. May. No. 131.
Cuscuta cuspidata Engelm. On Ambrosia. Moore County, Tex. August. No. 421.

SOLANACEÆ.

- Solanum elæagnifolium** Cav. Guthrie. May. No. 171.
Solanum Torreyi Gray. Cherokee Outlet; also Sumner County, Kans. June. No. 162.
Solanum triflorum Nutt. Neutral Strip; also Dallas County, Tex. August. No. 382.
Physalis hederæfolia Gray. Comanche and Clark counties, Kans. June. Nos. 237, 518.
Physalis lanceolata Mx. We-wo-ka; Guthrie; also Reno County, Kans. June and July. Nos. 108, 159, 298.
Physalis lobata Torr. Cheyenne country. June. No. 198.
Physalis mollis Nutt. Cimarron Valley. May. No. 169.
Physalis Peruviana L. Guthrie. May. No. 161.
Physalis viscosa L. Guthrie. May. No. 170.
Chamaesaracha sordida Gray. Cherokee Outlet; Seward County, Kans. In sand. July. No. 211.

SCROPHULARINEÆ.

- Linaria Canadensis** Dumont. Muscogee; Stony Point. April. No. 53.
Pentstemon albidus Nutt. Cherokee Outlet. June. No. 213.
Pentstemon ambiguus Torr., var. **Thurberi** Gray. Hartley County, Tex. In sand.
Pentstemon pubescens Solander. Okmulgee; Guthrie. April; May. Nos. 85, 147.
Collinsia violacea Nutt. Vinita. April. No. 33.
Mimulus glabratus HBK., var. **Jamesii** Gray. Stafford County, Kans. Sand Hills. July. No. 306.
Conoclea multifida Benth. Kingman County, Kans. In sandy soil. September. No. 515.
Herpestis rotundifolia Pursh. Cherokee Outlet. June. No. 266.
Gratiola Virginiana L. Muscogee. April. No. 83.
Veronica arvensis L. Muscogee; also Vinita. April. Nos. 22, 60.
Buchnera Americana L. Cherokee Outlet. September. No. 477.
Gerardia aspera Dougl. North Canadian River, Cherokee Outlet; Cheyenne and Arapahoe countries. August. No. 450.
Gerardia densiflora Benth. Logan County, Okla. August. No. 470.
Gerardia tenuifolia Vahl, var. **macrophylla** Benth. Cherokee Outlet, near Texas line. August. No. 439.
Castilleja purpurea Don. Cheyenne country. June. No. 195.
Pedicularis Canadensis L. Muscogee. April. No. 72.

OROBANCHACEÆ.

- Aphyllon Ludovicianum** Gray. Comanche County, Kans. June. No. 217.

ACANTHACEÆ.

- Dicliptera brachiata** Spreng. Arkansas City, Kans. September. No. 485.

VERBENACEÆ.

- Lippia cuneifolia** Steud. Guthrie. May. No. 149.
Verbena Aubletia L. Vinita. April. No. 7.
Verbena bipinnatifida Nutt. Oklahoma. May, July. Nos. 134, 177.
Verbena hastata L. Cañons of the Upper Cimarron. July. No. 360.

LABIATÆ.

- Mentha Canadensis* L. Clayton, N. Mex. August. No. 389.
Lycopus sinuatus Ell. Moore County, Tex. August. No. 425.
Salvia lanceolata Willd. Sedgwick and Clark counties, Kans. July. Nos. 243, 287.
Salvia lyrata L. Okmulkee. Woods. April. No. 87.
Monarda citriodora Cerv. Guthrie; Cheyenne country. May, June. Nos. 166, 191.
Monarda punctata L. A form. Kingfisher. June. No. 183.
Brunella vulgaris L. Logan County, Okla. August. No. 464.
Isanthus cæruleus Mx. Arkansas City, Kans. September. No. 492.
Teucrium laciniatum Torr. Cheyenne country. June. No. 186.

PLANTAGINEÆ.

- Plantago Patagonica* Jacq., var. *aristata* Gray. Kingfisher. June. No. 182.
Plantago pusilla Nutt. Muscogee. April. No. 64.
Plantago Virginica L. Vinita; Oklahoma City. April, May. Nos. 21, 130.

NYCTAGINEÆ.

- Oxybaphus angustifolius* Sweet. Cimarron Valley; Oldham County, Tex.; Cherokee Outlet; Caldwell, Kans. June, September. Nos. 223, 501.
Oxybaphus hirsutus Sweet. Cañons of the Upper Cimarron. July. No. 361.
Oxybaphus nyctagineus Sweet, var. *oblongifolius* Gray. Guthrie, Cimarron Valley. May. No. 166.
Oxybaphus nyctagineus Sweet, var. *pilosus* Gray. Barber County, Kans. Gypsum hills. June. No. 256.
Abronia fragrans Nutt. Morton County, Kans.; Cimarron cañons; Neutral Strip. August. No. 352.

This plant is described as having white bracts; our plants, as well as a plant collected in 1879 by Mr. Ball in Wichita County, Tex., has red bracts. Whether this is a form or variety can not be ascertained from the material at hand.

ILLECEBRACEÆ.

- Paronychia Jamesii* Torr. and Gray. Comanche County, Kans. June. No. 250.
 This plant is the same as Nealley's plant of 1889 (referred to *P. dichotoma*) and as Austin's No. 50 (referred to *P. setacea*). The four so-called species *P. dichotoma*, *Jamesii*, *Lindheimeri*, and *setacea*, seem hardly deserving of specific rank.
Paronychia sessiliflora Nutt. Neutral Strip. August. No. 379.

AMARANTACEÆ.

- Cladothrix lanuginosa* Nutt. Seward County, Kans. Sandy soil. July. No. 332.
Frœlichia gracilis Moq.¹ Barber County, Kans. June. No. 259.

¹ After an examination of the material in the National Herbarium of the five species belonging to the section *Oplotecha* of this genus, I am led to think that they should be reduced to two or three species. The section *Dilopha* is not represented in the collection, making a comprehensive examination of all the species of this genus impossible at this time. The crests of the ripened fruit appear to furnish the most satisfactory guide to the determination of these plants. The forms which have these crests spiny we may, for convenience, designate as the *Gracilis* group, including *F. gracilis*, *Floridana* and *Drummondii*, with the last two reduced to varieties of *gracilis*. The forms which have the crests in the form of entire or barely crenulate wings may be designated as the *Alata*, including *F. interrupta*, *tomentosa*, and Dr. Watson's Mexican *F. alata*.

- Frœlichia gracilis* Moq., var. *Floridana*. Wichita, Kans. June. No. 279.
Iresine celosioides L. Arkansas City, Kans. September. No. 486.

CHENOPODIACEÆ.

- Cycloloma platyphyllum* Moq. Comanche and Seward counties, Kans. June, September. Nos. 253, 533.
Corispermum hyssopifolium L. Salt plains of the Salt Fork in Cherokee Outlet, southeast of Kiowa, Kans.; Hartley County, Tex. August, September. Nos. 401, 506.

POLYGONACEÆ.

- Eriogonum alatum* Torr. Dallas County, Tex. In sand among rocks. August No. 397.
Eriogonum annuum Nutt. Reno County, Kans. Sandy districts. July. No. 293.
Eriogonum Jamesii Benth. Cimarron cañons, Neutral Strip; also on Rabbit Mountains, New Mexico. August. No. 373.
Eriogonum lachnogynum Torr. Morton County, Kans. July. No. 348.
Eriogonum longifolium Nutt. Seward and Stevens counties, Kans. In sand. July. No. 337.
Eriogonum tenellum Torr. Clayton, N. Mex., in Apache Cañon. August. No. 395.
Rumex Acetosella L. Muscogee; Stony Point. April. No. 54.

LAURINEÆ.

- Lindera Benzoin* Blume. Vinita. Woods. April. No. 24.

These specimens have pistillate flowers barely developed, and yet the leaves are $\frac{1}{2}$ inch long, which with the young shoots are pubescent. In this pubescence and the simultaneous appearance of flowers and leaves this western form seems distinct from the eastern.

EUPHORBIACEÆ.

- Euphorbia strictior* Holzinger n. sp. An erect perennial herb, from a thick deep root: diffusely branched from the base, 15 to 25 inches high, glabrous except the inflorescence; branches simple to the inflorescence, straight and rigid, grooved: leaves alternate, 1 to $2\frac{1}{2}$ inches long, 1 line or less wide, generally more than twice the length of the internodes, becoming relatively shorter toward the inflorescence, sessile by a tapering base, the margin entire and revolute; texture thick and leathery; no venation apparent except the midrib on the under side; branches of the bi- or trifurcate inflorescence subtended by opposite or whorled leaves toward the extremities reduced, and there surpassed by the involucre-bearing pedicels; pedicels $\frac{1}{2}$ inch long, erect; involucre cup as broad

The subjoined disposition of these forms is suggested.

Frœlichia, § *Oplotecha*.

I. *Graciles*. Crests spiny.

a. Crests 2, the alternate ones reduced each to a basal tubercle.

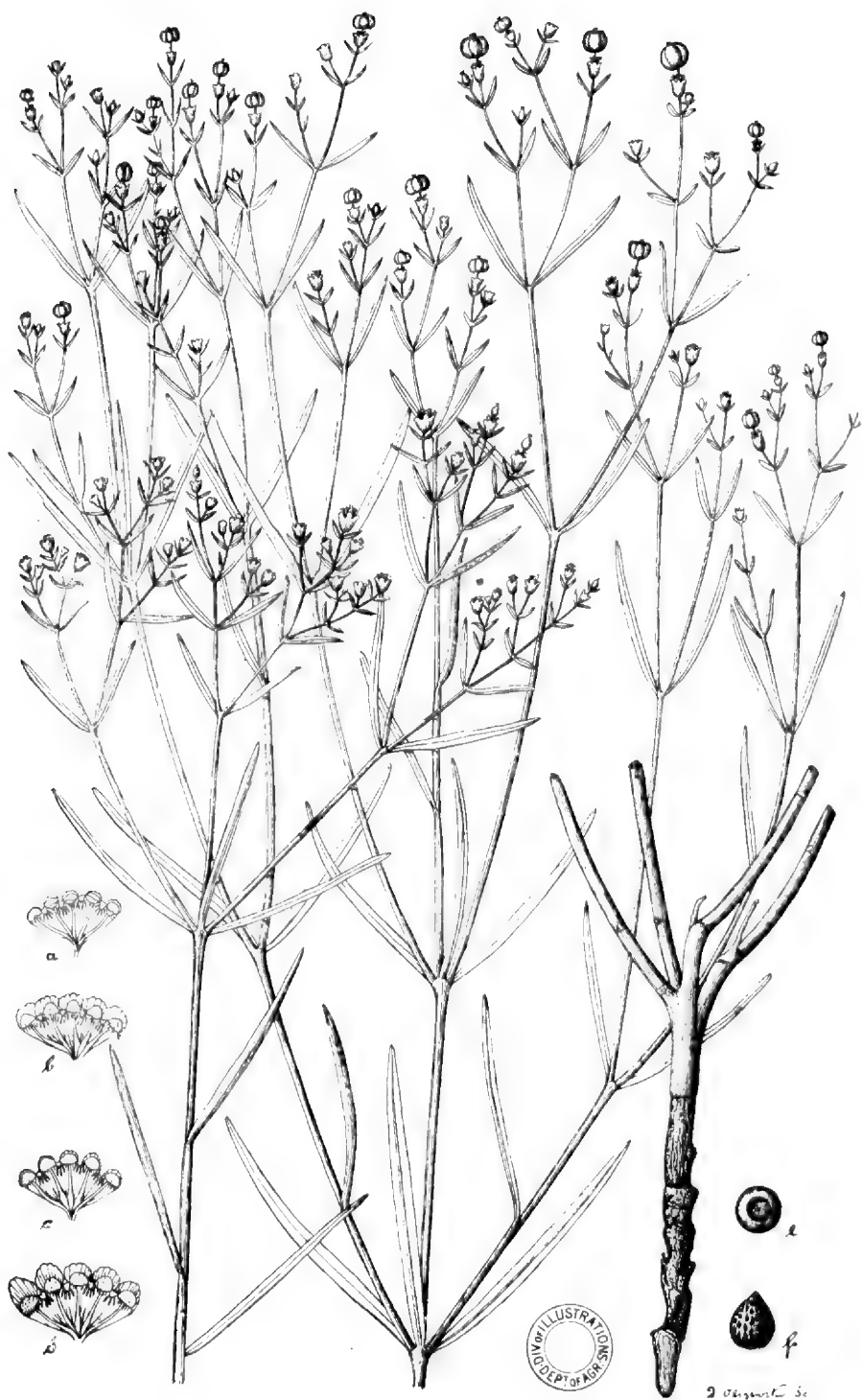
1. Branching diffusely from the base: *F. gracilis* Moq.

2. Larger, more erect, less branching: *F. gracilis* Moq., var. *Floridana*.

aa. Crests 5, the alternate ones each of 1 to 3 sharp spines: *F. gracilis* Moq., var. *Drummondii*.

II. *Alatæ*. Crests in the form of entire or barely crenulate wings: *F. interrupta*, *tomentosa*, *alata*.

I am not prepared to differentiate these last three species. With more material than is at present available they may be found reducible to two, or one, good species. Certainly they look puzzlingly alike, so far as the present material shows.



EUPHORBIA STRICTIOR Holzinger, n. sp.

as high, minutely puberulent: glands 4 or 5, yellowish, the petaloid appendage reduced to a narrow, minutely scalloped margin; the pedicels carrying the yellow anthers on short filaments raised above the cup; ovary raised on an erect pedicel 1 line long, puberulent when young, becoming glabrate with age; the three short styles slightly bifid; fruit when mature spherical in outline, nearly 2 lines in diameter, grooved between the carpels, crowned by the short persistent styles, tardily dehiscent; seed oval, $1\frac{1}{2}$ lines long, grayish-green, obscurely pitted, pointed at small end, marked at large end with a circular depressed area. Oldham County, Tex. August. No. 409.

EXPLANATION OF PLATE XVIII.—Lower and upper part of plant natural size. Figs. *a*, *b*, *c*, *d*, involucre, laid open, respectively of *E. polyphylla*, *discoidalis*, *strictior* Wrightii, seen from the inside. Fig. *e* end view, Fig. *f* side view of seed of *E. strictior*, 3.

This differs from the type of *E. Wrightii* in the National Herbarium in being less diffusely branched, with the branches more erect and more rigid; leaves shorter, those in the inflorescence markedly reduced, shorter than the subtended pedicels; petaloid appendages much narrower than the glands; fruit and seeds larger. *E. Wrightii* is described as having 4 glands; one of the first involucre examined from the type specimen had 5.

These two western species of *Euphorbia* are singularly paralleled by two closely related Florida species, *E. discoidalis* Chapman and *E. polyphylla* Engelm. In *E. discoidalis* the leaves of the inflorescence surpass the ultimate pedicels; in *E. polyphylla* they are shorter than the pedicels and bract-like. There is no appreciable difference in their seeds.

Dr. Chapman, on a recent visit to the National Herbarium (May, 1892), stated that he considered his own *E. discoidalis* and Engelm. *E. polyphylla* one and the same species; that he had had correspondence with Dr. Engelm. on this point, but was not sure that he had convinced that gentleman. Subsequent study and comparison of these plants by the writer tend to establish the claim of *E. polyphylla* to a distinct species. The only mention of it in the author's works is on page 535: "*Euphorbia polyphylla* Engelm. Patterson, Check List, p. 115 (name only)." Search for the description has proved fruitless. The only publication known is through Curtiss' plant No. 2498,* accompanied by a printed label, "*Euphorbia polyphylla* Eng., n. sp. Dry, sandy soil. Indian River, Florida," found in the herbaria at Columbia College, New York City, at Cambridge, Mass., and at the Department of Agriculture. I therefore give here a description of this species:

***Euphorbia polyphylla* Engelm. in herb.** An erect perennial, 6 to 12 inches high, with usually several branches or primary stems from the base, simple for 5 to 10 inches; leaves alternate, crowded, numerous (somewhat as in *Asclepias verticillata*), linear, succulent; those of the inflorescence opposite and always shorter than the subtended pedicels; inflorescence bi- or trifurcate, its branches elongated at maturity, and spreading; color of glands of the involucre purplish; ovary, fruit, and seed not appreciably different from those of *E. discoidalis*.

Thus, while these two Florida plants are certainly closely related, *E. polyphylla* differs in the short bracts of the inflorescence and the numerous, succulent leaves of the stem. The glands in both vary from "5" to 4.¹

¹ These species may be distinguished as in the subjoined arrangement:

a. Glands yellowish

1. *Euphorbia Wrightii* Torr. and Gray. Pac. R. R. Rep. ii. 1855, 174.
Leaves of inflorescence longer than subtended pedicels.
2. *Euphorbia strictior* Holzinger. Petaloid appendage quite narrow.
Leaves of inflorescence shorter than subtended pedicels.

b. Glands purplish.

3. *Euphorbia discoidalis* Chapm. Fl. S. States, 1865, 401.
Leaves of inflorescence longer than subtended pedicels. Stem leaves relatively broad.

- Euphorbia corollata** L. Guthrie. Wooded hills. May. No. 136.
Euphorbia dentata Mx. Neutral Strip; Cimarron Cañon. August. No. 372.
Euphorbia dictyosperma Fisch. and Mey. Muscogee; Sacred Heart Mission. April. No. 20.
Euphorbia Fendleri Torr. and Gray. Comanche County, Kans. June. No. 251.
Euphorbia glyptosperma Engelm. Cherokee Outlet; Stevens County, Kans. In sand. June and July. No. 263.
Euphorbia heterophylla L. In woods. Arkansas City, Kans. September. No. 483.
 This species is the same as *E. cyathophora* Jacq.; and *E. barbellata* Engelm. is probably not even a good variety of *E. heterophylla*. In aspect and variability of leaves Engelmann's plant agrees exactly with *E. heterophylla*. The only character indicated in the specific name *barbellata* is found in varying degree in the Linnean species and is not constant in all the leaves of any one plant. Plants with strong bunches of hairs at the base of the leaves may at most be designated by *E. heterophylla* L., var. *barbellata*.
Euphorbia hexagona Nutt. Wolf Creek, Cherokee Outlet, near Texas boundary. August. No. 441.
Euphorbia lata Engelm. Cherokee Outlet. June. No. 263a.
Euphorbia maculata L. Edwards County, Kans. July. No. 316.
Euphorbia peplidion Engelm. Oklahoma City. Stony wastes. May. No. 126.
Euphorbia zygophylloides Boiss. Comanche County, Kans. June. No. 236.
Reverchonnia arenaria Gray. Oldham County, Tex. August. No. 415.
Jatropha stimulosa Mx. Guthrie. Sand hills. May. No. 137.
Croton capitatus Mx. Cherokee Outlet; near Caldwell, Kans. September. No. 502.
Croton monanthogynus Mx. Oklahoma proper. July. No. 180.
Croton Texensis Muell. Barber County, Kans. June. No. 260.
Acalypha Virginica L. Arkansas City, Kans. September. No. 489.
Tragia nepetæfolia Cav. Guthrie. May. No. 143.
Stillingia sylvatica L. Little Salt Marsh, Stafford County, Kans. July. No. 158.

URTICACEÆ.

- Urtica gracilis** Ait. Clayton, N. Mex. August. No. 391.
Pilea pumila Gray. Arkansas City, Kans. September. No. 488.

CUPULIFERÆ.

- Betula lutea** Mx. f. Okmulkee. Woods. April. No. 92.

ORCHIDEÆ.

- Spiranthes cernua** Richards. Pratt County, Kans. September. No. 552.

4. **Euphorbia polyphylla** Engelm. Curtiss' Herbarium specimen, No. 2498,* 1879 (?), and name cited in Engelmann's Works, p. 535, and in Patterson's Check List.

Leaves of inflorescence always shorter than subtended pedicels. The erect, simple stems crowded with short, linear, succulent leaves.

[Mr. Simpson sent in the following description of this plant as observed in the field: "Perennial; stems several from the same root, or branching from the ground; ascending, slender, very leafy, smooth, 6 to 10 inches high; leaves linear, fleshy, semiterete, smooth, entire, alternate, obtuse, sessile, 8 to 12 lines long, a line or less wide," corroborating the impression that the leaves are succulent.]

These species of *Euphorbia* belong to the section *Adenopetalum* Benth., and the subsection *Tithymalopsis* Glotzsch et Garke (as genus). See Engler u. Prantl., Nat. Pflanzenfam. iii teil, 5 abt., 101.

IRIDEÆ.

- Nemastylis acuta* Herb. Creek Nation. April. No. 97.
Sisyrinchium bellum Watson. Muscogee. April. No. 67.

AMARYLLIDÆ.

- Hypoxis erecta* L. Muscogee. April. No. 48.

LILIACEÆ.

- Smilax bona-nox* L. Oklahoma City. May. No. 123.
Allium reticulatum Fras. Okmulkee. April. No. 86.

PONTEDERIACEÆ.

- Heteranthera limosa* Vahl. Cherokee Outlet. June. No. 267.

COMMELINACEÆ.

- Commelina Virginica* L. Guthrie. May. No. 163.

JUNCACEÆ.

- Juncus marginatus* Rostk. Stafford and Kingman counties, Kans. July, September. Nos. 300, 544.
Juncus nodosus L., var. *megacephalus* Torr. Neutral Strip. August. No. 377.
Luzula campestris DC. Okmulkee. Woods. April. No. 94.

ALISMACEÆ.

- Sagittaria calycina* Engelm. Cherokee Outlet. June. No. 286.
Sagittaria variabilis Engelm. Cherokee Outlet. June. No. 262.

NAIADACEÆ.

- Ruppia maritima* L. Big Salt Marsh, Stafford County, Kans. July. No. 301.

CYPERACEÆ.

- Cyperus aristatus* Rottb. Stafford County, Kans. Salt marsh. July. No. 304.
Cyperus diandrus Torr. Kingman County, Kans. Sandy soil. September. No. 546.
Cyperus filiculmis Vahl. Wichita, Kans. July. No. 282.
Cyperus Hallii Britton. Sumner County, Kans. June. No. 270.
Cyperus Houghtoni Torr. Barber County, Kans. June. No. 261.
Cyperus speciosus Vahl. Cherokee Outlet, near Texas boundary. August. No. 443.
Cyperus strigosus L., var. *capitatus* Boeckl. Kingman County, Kans. Sandy soil. September. No. 543.
Eleocharis palustris R. Br. Guthrie. May. No. 148.
Scirpus atrovirens Muhl. Cimarron Cañon, Neutral Strip. August. No. 376.
 This plant has the spikelets fewer and a little larger than in the typical form; but in its scales, in the shape and papillose surface of its akenes, and in the bristles it agrees with this species.
Scirpus pungens Vahl. Stafford County, Kans. Salt marsh. July. No. 157.
Hemicarpha subsquarrosa Nees. Kingman County, Kans. September. No. 547.
Carex Cherokeeensis Schw. Sacred Heart Mission; also Cimarron Cañon, Neutral Strip. August. No. 113.
Carex Davisii Schw. and Torr. Wewoka. May. No. 103.
Carex fusca All. Muscogee. April. No. 77.

- Carex granularis** Muhl. Muscogee. April. No. 82.
Carex grisea Wahl., var. **globosa** Bailey. Muscogee and Wewoka. April, May. Nos. 81, 104.
Carex laxiflora Lam. Vinita. April. No. 15.
Carex microdonta Torr. Cimarron Cañon, Neutral Strip. August. No. 113a.
Carex Muhlenbergii Schkuhr, var. **australis** Olney. Muscogee. April. No. 79.
Carex riparia W. Curtis. Muscogee. In a marsh. April. No. 84.
Carex rosea Schkuhr, var. **retroflexa** Torr. Muscogee. April. No. 78.
Carex rosea Schkuhr, var. **Texensis** Torr. Vinita. April. No. 45.
Carex stricta Lam. Guthrie. May. No. 144.
Carex tetanica Schkuhr, var. **Meadii** Bailey. Vinita; Muscogee. April. Nos. 36, 65.
Carex triceps Mx. Muscogee. April. No. 80.
Carex varia Muhl. Muscogee and Okmulkee. April. Nos. 77, 91.

GRAMINEÆ.

- Tripsacum dactyloides** L. Cimarron Valley. June. No. 225.
Andropogon Hallii Hack. Stevens and Clark counties, Kans.; Neutral Strip. June, July. No. 343.
Andropogon saccharoides Swartz, var. **submuticus** Vasey. Comanche County, Kans. June. No. 252.
Hilaria Jamesii Benth. Clayton, N. Mex. August. No. 396.
Paspalum setaceum Mx. Wichita, Kans. July. No. 278.
Eriochloa punctata Hamil. Clark County, Kans. September. No. 520.
Panicum anceps Mx. Kingman County, Kans.; Logan County, Okla. July, August. Nos. 467, 548.
Panicum autumnale Bosc. Comanche County, Kans. Sandy soil. September. No. 512.
Panicum depauperatum Muhl. Creek Nation. Stony hill. April. No. 98.
Panicum obtusum HBK. Cheyenne country. June. No. 197.
Panicum scoparium Lam. Wewoka. May. No. 107.
Panicum virgatum L. Ford County, Kans.; Moore County, Tex. July, August. Nos. 322, 422.
Setaria glauca Beauv. Moore County, Tex. August. No. 423.
Leersia oryzoides Swz. Sumner and Pratt counties, Kans. In sloughs. September. No. 498.
Phalaris intermedia Bosc. Wewoka. May. No. 110.
Aristida basiramea Engelm. Kingman County, Kans. September. No. 542.
Aristida dispersa Trin. and Rup. Clark County, Kans. Saline soil. September. No. 516.
Aristida Humboldtiana Trin. and Rup. Seward and Meade counties, Kans. September. No. 537.
Aristida oligantha Mx. Clark County, Kans. September. No. 521.
Aristida purpurea Nutt., var. **Hookeri** Trin. Ford County, Kans. July. No. 312.
Muhlenbergia gracillima Torr. Neutral Strip; Clark County, Kans. August. Nos. 387, 525.
Muhlenbergia Mexicana Trin. Kingman County, Kans. September. No. 549.
Lycurus phleoides HBK. Cimarron cañons. Rocky mesas. August. No. 364.
Alopecurus geniculatus L., var. **aristulatus** Munro. Muscogee. April. No. 60.
Sporobolus airoides Torr. Reno County, Kans. July. No. 296.
Sporobolus asper Kunth. Arkalon; also Meade County, Kans. September. No. 532.
Sporobolus asper Kunth. A variety. Clark County, Kans. Sandy saline soil. September. No. 522.
Sporobolus asperifolius Thurber. Clark County, Kans. September. No. 523.

- Sporobolus cryptandrus** Gray. Seward, Stevens, and Comanche counties, Kans.; Dallas County, Tex. July, August, and September. Nos. 335, 400, 513.
- Sporobolus Texanus** Vasey. Contr. Nat. Herb., iii, 63. Clark County, Kans. Sandy, saline soil. September. No. 524.
- Sporobolus vaginæflorus** Vasey. Meade County, Kans. Sandy soil. September. No. 531.
- Calamagrostis longifolia** Hook. Stevens and Comanche counties, Kans. July. Nos. 342, 513.
- Danthonia spicata** Beauv. Okmulkee. Woods. April. No. 90.
- Chloris verticillata** Nutt. Cherokee Outlet. June. No. 210.
- Schedonnardus Texanus** Steudel. Gray County, Kans. July. No. 330.
- Bouteloua eriopoda** Torr. Oldham County, Tex. Sand.
- Bouteloua hirsuta** Lag. Neutral Strip. August. No. 374.
- Bouteloua oligostachya** Torr. Ford County, Kans. July. No. 320.
- Bouteloua racemosa** Lag. Cherokee Outlet. June. Nos. 264, 265.
- Munroa squarrosa** Torr. Edwards County, Kans. July. No. 318.
- Triodia cuprea** Jacq. Sand soil, in Black-jack forest. Comanche County, Kans. August, September. Nos. 455, 511.
- Triodia purpurea** Hack. Comanche County, Kans. September. No. 514.
- Redfieldia flexuosa** Vasey. Stafford County, Kans. Sandy hills. July. No. 305.
- Diplachne fascicularis** Beauv. Clark County, Kans. September. No. 517.
- Diplachne rigida** Vasey. Seward County, Kans.; Kiowa; Englewood, Kans. July, September. No. 339.
- Eragrostis curtipedicellata** Buckl. Clark County, Kans. September. No. 519.
- Eragrostis oxylepis** Torr. Cherokee Outlet and Neutral Strip. June, August. Nos. 207, 384.
- Eragrostis pectinacea** Gray, var. *spectabilis* Gray. Barber County, Kans. September. No. 510.
- Eragrostis Purshii** Schrad. Haskell County, Kans. July. No. 327.
- Eragrostis reptans** Nees. Near Salt Fork, Cherokee Outlet. September. No. 505.
- Eragrostis tenuis** Gray. Cherokee Outlet, near Texas line. August. No. 442.
- Uniola latifolia** Mx. Logan County, Kans. August. No. 471.
- Distichlis maritima** Raf., var. *stricta* Torr. Guthrie; Stafford County, Kans. July. Nos. 156, 303.
- Poa annua** L. Muscogee. April. No. 58.
- Poa arachnifera** Torr. Wewoka, Oklahoma. May, July. Nos. 100, 180.
- Festuca tenella** Willd. Creek Nation; Oklahoma City; Cherokee Outlet. May, June. Nos. 41, 121, 206.
- Bromus unioloides** Willd. Wewoka. May. No. 43.
- Agropyrum glaucum** R. and S. Comanche County, Kans. June. No. 245.
- Hordeum jubatum** L. Comanche County, Kans. June. No. 240.

FILICES.

- Woodsia Mexicana** Fée. Cimarron Cañon. Rocky mesas. August. No. 365.
- Cheilanthes lanuginosa** Nutt. Neutral Strip. Rocky mesas. August. No. 368.
- Cheilanthes Lindheimeri** Hook. Neutral Strip. Rocky mesas. August. No. 367.
- Pellaea atropurpurea** Link. Neutral Strip. Among rocks. August. No. 363.
- Asplenium ebeneum** Ait. Neutral Strip. August. No. 366.
- Notholæna nivea** Don., var. *dealbata* Dav. Arkansas City, Kans. September, No. 494.

CHARACEÆ.

- Chara gymnopitys** A. Br. var. Stafford County, Kans. July. No. 302.
- T. F. Allen considers this form a new variety.

OBSERVATIONS ON THE NATIVE PLANTS OF OKLAHOMA TERRITORY AND ADJACENT DISTRICTS.

By M. A. CARLETON, *assistant botanist, Kansas Agricultural Experiment Station.*

In order to make out anything like a complete statement of the distribution and variations of the native plants of the above-named country, it would, of course, be necessary to survey systematically the entire territory included, visiting each district at all seasons of the year and taking two or three years of time for the purpose. The following notes are taken from a sojourn of less than six months in the regions mentioned during the summer of 1891, although several of the districts were visited two or three times during the summer. However, I have taken pains to investigate all distributions and variations of plants that seemed to be in any way significant, and it is hoped the following summary of results may prove interesting.

I shall first give some notes on the plants of the different districts of this region, and then direct attention to certain groups.

The entire region over which I have worked is approximately included between the Arkansas and Canadian rivers, west of Arkansas and east of Colorado and New Mexico, but some of my notes will refer to the northeast portion of the Indian Territory and of New Mexico and the southeast portion of Colorado. For convenience I divide the whole region into five parts: (1) Oklahoma proper and eastern Indian Territory (or the Indian Territory east of the 98th meridian); (2) western Indian Territory (west of the 98th meridian), excluding No Man's Land; (3) southwest Kansas (that part of Kansas cut off by the Arkansas River); (4) No Man's Land or Neutral Strip; and (5) Texas Panhandle north of the Canadian River.

OKLAHOMA PROPER AND EASTERN INDIAN TERRITORY.

The greater part of this district I have visited but once, and then early in the spring, and therefore can not say much about its flora from my own knowledge. But I believe I have made sufficient observations to justify me in expressing the opinion that it is a country in the main

more especially adapted to horticulture, and in some places, perhaps, stock-raising. I base this opinion partly upon the unusual abundance of native species of fruits and partly upon the kind of soil present. But of course there are other things to be taken into account, and I fully admit the possibility of my being wrong in the matter.

I am especially inclined to believe that small fruits and plums and perhaps pears will do well in this district, particularly in the southern and eastern portions, while peaches are already quite successfully grown by Indians and squaw men in the Cherokee Nation. The soil seems to have the clayey consistency desirable for some fruits—as the plum—and yet with sufficient sand or gravel to allow necessary drainage.

Moreover, native fruits are found in great abundance, as a rule. In the Cherokee and Creek nations haws are extremely common, their blossoms giving a white appearance to the woods and filling the air with fragrance. They include the species *Crataegus arborescens* Ell. and *C. tomentosa* L., var. *mollis* Gray, and no doubt others that I did not observe. In nearly all this district the following species are quite common, especially the first named: Chickasaw plum (*Prunus Chicasa* Mx.), the ordinary wild plum (*Prunus Americana* Marshall), the wild cherry (*Prunus serotina* Ehrh.), and *Prunus gracilis* Eng. and Gr.; and in the timbered portions of the southern part of this district dewberries and strawberries are so very abundant as to form extensive wild gardens, as I observed myself, both to my pleasure in the berries they furnished and to my annoyance in the obstruction they offered to the pedestrian. The common blackberry and raspberry (*Rubus villosus* Ait. and *R. occidentalis* L.) are also found everywhere, and a low, bushy species of blackberry (*Rubus trivialis* Mx.) seems to be rather common at Vinita.

The usual western grasses thrive well, and a native species of clover (*Trifolium Carolinianum* Mx.) is common at Okmulkee, the capital of the Creek Nation. Another larger-headed, clover (*Trifolium reflexum* L.) was collected in the southern Seminole Nation, but did not seem to be very frequent.

In the eastern portions there is excellent timber, including quite a number of the common oaks, several hickories, hard and soft maple, green ash, the elms, box elder, sycamore, yellow birch, black walnut, cottonwood, etc. Post oak is especially common, and makes fairly good timber. Farther westward, except along streams, forests are reduced to small groves of gnarly "black jack," remotely scattered here and there. From my one trip through the eastern part of this district it was impossible to gain much thorough knowledge of its timber.

WESTERN INDIAN TERRITORY.

For the entire region included in Kansas and Indian Territory the 28th meridian may be taken as a very good arbitrary line separating the Great Plains flora into an eastern and western section, some-

what distinct from each other in the character of their predominant species. The natural boundary, it is true, would follow a zigzag course, crossing this line many times, but its average course would lie just about on this meridian. Going westward, such species as the following first make their appearance at this line: *Astragalus mollissimus* Torr. ("loco"), *Gaillardia pulchella* Foug., *Malvastrum coccineum* Gray, *Artemisia filifolia* Torr. ("sagebrush"), *A. Wrightii* Gray, etc., while others, though occasionally found east of this line, now become more largely predominant, as *Gaillardia lanceolata* Mx., *Yucca angustifolia* Pursh ("Mexican soap-plant"), *Solanum elaeagnifolium* Cav., *Evolvulus argenteus* Pursh, the grama grasses and several of the Drop-seed grasses.

And so, almost immediately after passing the meridian near Kingfisher, the flora of this district begins to exhibit the distinctive character common to the western Great Plains.

During the season of 1891 there was an excellent growth of grasses nearly all over this district, consisting mainly of the blue-stems (*Andropogon provincialis* Lam., *A. nutans* Linn., and *A. Hallii* Hack., v. *flavcolus* Hack.), interspersed throughout with a rich carpet of Buffalo grass. But the season was an exceptionally wet one.

A very brilliant eryngium (*Eryngium diffusum* Torr.) gives pleasing variety in some places to the usual monotony of this district; while there are densely grown patches of the following species, scattered here and there: *Rudbeckia hirta* L., *Monarda citriodora* Cerv., *Hosackia Purshiana* Benth., *Solanum elaeagnifolium* Cav., and *Phaseolus pauciflorus* Benth. The last three are often found growing together in prairie-dog towns, sometimes with *Callirrhoe involucrata* Gray, and occasionally *Martynia proboscidea* Glox.

In the North Canadian Valley a curious velvet-flowered crucifer (*Streptanthus hyacinthoides* Hook.) appears as a species rather rare in this district, so far as I have observed, and on the south side of the same river, where the country is much different from the north side, *Lespedeza reticulata* Pers. is occasionally found mingling with the more common *L. capitata* Mx. Then the Gypsum Hills have their peculiar flora, to which I shall refer again. Although the greater portion of this district will probably continue to be adapted only to the practice of stock-raising, still there is no good reason why the eastern part may not become a fine wheat-growing country, especially since it lies mainly south of the counties of Harper and Barber, in Kansas, which have already made a good record as a wheat-producing region. Besides, the amount of rainfall, in the same longitude, seems to increase toward the south.

SOUTHWEST KANSAS.

Until during the last three years the plants of this district have been very little known to botanists, and now the results of recent collections disclose to us a flora rich in interesting forms, both in the way of add-

ing to our list many species new to Kansas, and exhibiting very strikingly the transition from the eastern to the western plains flora. Prof. W. A. Kellerman and Mr. B. B. Smyth have preceded me in making collections of the plants of this district, and reported quite a number of the species that I shall mention in these notes.

Here we find species that would be wholly out of place in eastern Kansas, but which become very familiar to the collector in the "Panhandle" or Neutral Strip, and which are invariably characteristic of sandy barren regions.

But, going westward, before we reach the more barren portions of the district we first find in Kingman, Pratt, Barber, and Comanche counties an extension from the Territory of the outcropping "red beds." Here there is not such a continuity of the flora as in the sandy regions, but there are certain unusual forms quite local and broken in their range, such as the following species: *Oxytropis monticola* Gray, found so far only at Kingman, *Gaillardia simplex* Scheele., *Astragalus bisulcatus* Gray, *Senecio Douglasii* DC. and *Aster oblongifolius* Nutt., var. *rigidulus* Gray. Gypsum hills, too, are numerous here, and are accompanied by their peculiar flora. *Juniperus Virginiana* L. and *Celtis occidentalis* L. occur among these hills, the former probably as an extension of its range from the Territory, rather than from eastern or northern Kansas.

Aside from the plants of the "red beds" and sandy regions, there are a few others that become familiar forms in western Kansas, distributed quite generally over the high prairies. Of these, besides various cacti, buffalo-grasses, and the grama grasses (*Bouteloua racemosa* Lag., *B. oligostachya* Torr. and *B. hirsuta* Lag., there are the following species: *Lepachys Tagetes* Gray (both purple and yellow-rayed forms), *Gaillardia pulchella* Foug., *Engelmannia pinnatifida* Torr. and Gray, *Erysimum asperum* DC., *Astragalus lotiflorus* Hook., *A. mollissimus* Torr., *Ipomœa leptophylla* Torr., *Oenothera Hartwegi* Benth, etc.

The prevailing sunflower for all this district, and in fact for the entire Arkansas Valley of the Great Plains, is *Helianthus petiolaris* Nutt., although *H. annuus* L. is quite common.

Throughout this district, as in western Indian Territory, the most important forage grasses are the buffalo-grass, blue-stems, switch grass (*Panicum virgatum* L.), and the grama grasses. Along the Cimarron River *Sporobolus asperifolius* Thurb. and *Muhlenbergia gracillima* Torr. are also rather common, occurring in dense patches. One of the worst weeds among the grasses is *Schedonnardus Texanus* Steudel, which grows so thickly from Gray County westward as to become quite an annoyance in the fields, particularly in those not constantly cultivated, and is very provoking to the teamsters, by gathering mud on the wheels of the wagon after a rain.

In Seward County, the common "tumble weed" is *Cycloloma platyphyllum* Moq. I saw specimens of this species on exhibition at Arkalon which measured as much as 3 feet across. It is common in sandy wastes.

There are some interesting species in the extreme southwestern portion of this district that, as far as yet known, seem barely to have crossed the Kansas line in their distribution northward. A particularly interesting locality, in which alone some of these species have so far been found in Kansas, is the Point of Rocks, a series of rocky bluffs jutting out on the north side of the Cimarron River, near the Territory line, in Morton County, at which place the headquarters of a number of cattle men have been established for some time. I shall mention some of these species that I noted at this place and in a few other localities.

Krameria secundiflora DC. is common from Guthrie to Kingfisher, Okla., and westward, but collected in Kansas only at Point of Rocks. The following have also been found so far only at Point of Rocks: *Eriogonum lachnogynum* Torr., *Berlandiera lyrata* Benth., and *Petalostemon violaceus* Mx., var. *tenuis* Coulter. The last one, described by Coulter in his Manual of the Phanerogams and Pteridophytes of western Texas, is common farther south and west in Neutral Strip and Texas. A singularly dwarfed form of *Eurothera serrulata* Nutt. is also found at Point of Rocks, which is common on gypsum hills in Indian Territory and in Neutral Strip and Panhandle, but seen nowhere else in Kansas. *Convolvulus incanus* Vahl also has so far been found only in Morton County, and *Pectis angustifolia* Torr., and *Franseria discolor* Nutt. only in Seward County, besides others.

NEUTRAL STRIP (BEAVER COUNTY, OKLA.).

This district exhibits more fully the prevailing species of the southwestern Great Plains. Following the Cimarron River westward, the species already mentioned as barely crossing the Kansas line first become more common, then other new species appear, and finally, the valley of the Cimarron assuming cañon form, and reaching the mesas terminating the spurs of the mountains, the flora presents an appearance quite similar to that of eastern New Mexico and the cañons of Texas Panhandle.

About 50 miles up the river from Morton County, Kans., two or three species of "tree cactus" are first found, also a new *Mentzelia*, *M. multiflora* Gray, *Paronychia sessiliflora* Nutt., *Desmanthus Jamesii* Torr. and Gray, several interesting ferns among the mesas, a new grass, *Lycurus phleoides* HBK., etc. Besides, nearly all the species found in Morton, Stevens, and Seward counties, Kans., now become very common.

On the divide between the Cimarron and North Canadian great patches of *Hymenopappus flavescens* Gray occur, filling the air with their pungent odor. In the same region *Eragrostis oxylepis* Torr. and *Muhlenbergia gracillima* Torr. are quite common, as well as *Gaillardia pinnatifida* Torr., and a variety of *Chrysopsis villosa* Nutt., while *Hoffmanseggia stricta* Benth. grows in patches scattered about.

Of trees, the following were noted in the Cimarron Cañon: hackberry, red cedar, cottonwood, and soapwood (*Sapindus marginatus* Willd.); also a species of willow (unrecognized), and among the mesas a small sensitive plant (*Mimosa borealis* Gray).

A very troublesome weed in the Cimarron cañons is *Tribulus maximus* L. Even within the recent beginning of settlement of the Neutral Strip this plant has spread quite rapidly over the few cultivated fields. I found it growing on the farm of J. J. Burnett, at Garrett. He told me it was already quite an annoyance.

In some places in the cañons very fair crops can be raised by irrigation from springs flowing out of the mesas.

TEXAS PANHANDLE.

Although this is a large district, still I can give only a few notes in regard to its flora, as I have made but one trip through it, passing from Clayton, N. Mex., along the Denver, Texas and Fort Worth Railroad to Tascosa; thence down the cañons of the South Canadian River to Canadian City, and thence northward along the Santa Fe Railroad into the Indian Territory.

Great portions of this district are vast plains of sand, but which during the season of 1891 were clothed with a very good growth of grasses, including the blue stems and a few species of the genera *Sporobolus*, *Bouteloua*, *Triodia*, and *Panicum*. These plains, on reaching the river, are broken up into rocky mesas, and here the flora is rather different.

Nearly all the characteristic species of the western Great Plains, already mentioned as occurring in the other districts, are also found everywhere in this district. Hence I shall note only a few of the species not already mentioned.

The following species are found on the sandy plains of the western and northern portions: *Eriogonum alatum* Torr., a giant Eriogonum, more than 4 feet tall, common in the sand and on rocky bluffs in Dallam County; *Gilia rigidula* Benth., a small blue-flowered Gilia, found in Dallam and Moore counties; *Pentstemon ambiguus* Torr., white flowered, small, in Hartley County; *Helianthus ciliaris* DC., collected on high prairies in Moore County, and *Cuscuta cuspidata* Eng., parasitic on *Artemisia filifolia* Torr. and *Ambrosia psilostachya* DC., also in Moore County.

Along the Canadian Cañon a number of interesting species were also noted. At Tascosa were found *Bigelovia Wrightii* Gray, *Baccharis salicina* Torr. & Gray, and the mesquit, *Prosopis juliflora* DC., the beans of which are used by Mexicans and Indians for food. A grove of this last species was also noted in the Cheyenne and Arrapahoe reservation, about 12 miles northeast of Cantonment. It is also called *screw-bean*, and is quite common over the Southwest. A cactus (*Opuntia leptocaulis* DC.), with very fine-looking fruit, was also collected at

Tascosa. The fruit is brilliant red, and at a distance looks like flowers. It furnishes an acid juice that is quite refreshing to the tired traveler. *Bouteloua eriopoda* Torr. grows in abundance near Tascosa. At Canadian City a splendid malvaceous plant (*Hibiscus lasiocarpus* Cav.) is common in the Canadian Valley (which here loses its cañon form); also *Asclepias incarnata* L. var. *longifolia* Gray was collected in the same locality.

One of the foxtails (*Setaria glauca* Beauv.) forms a good part of the hay in the Canadian Valley, and is considered to be of good quality.

The button bush (*Cephalanthus occidentalis* L.) is a very common shrub in this valley and along streams in western Indian Territory.

This district is, on the whole, one vast cattle range, with a few cultivated fields in the Canadian cañons, watered by springs in the mesas.

PLANTS CHARACTERISTIC OF SANDY REGIONS.

Having given some attention to the distribution of plants for several years, I have become especially interested in the fact commonly known that certain plants are usually associated with particular soils and climates. However, I can not hope to give anything new in this line, except in so far as I may be able to present some additional observations, that may be of interest, from a study of the flora of the above districts.

It has been noted by nearly all observers, I suppose, who have had opportunity, that the plants of sandy or desert regions are usually, and uniformly, protected against rapid transpiration by thickened leaves and epidermis, absence or narrowness of leaves, or an unusual amount of wooliness or hairiness. Now, as one would expect, we find such characters commonly belonging to the species prevailing in the western Great Plains. Of course the Great Basin and other regions farther west and south than these districts that have come more immediately under my own observations would probably furnish still better examples of this peculiarity in plant distribution; but various circumstances do not permit me to include any notes upon those regions, although I have been over a portion of the Great Basin.

It is particularly interesting to trace the gradually increasing tendency to assume these protective characters on the part of those species inhabiting both the eastern and western portions of the Great Plains in their distribution westward. The very common evening Primrose (*Enothera serrulata* Nutt.) furnishes a good illustration. I have seen specimens of this species in eastern Indian Territory growing more than 2 feet tall, with flowers nearly 2 inches across, while in Panhandle, Texas, Neutral Strip, and at Point of Rocks, Kans., it becomes peculiarly dwarfed, often not more than 6 inches tall, with flowers little more than half an inch across, and the leaves and branches become more whitish, narrower, and yet thicker, and the entire plant more massive in proportion to its height. Between these extremes in-

intermediate forms can be traced. *Chrysopsis villosa* Nutt. and *Aplopappus spinulosus* DC. are well known to be quite variable, but their variations, to the eastward and westward especially, will nearly always be found to be in the line of a greater or less presence of protective characters. Of the former, the very names of many of the described varieties ought to, and do, indicate these facts, such as *canescens*, *hispida*, *foliosa*, *stenophylla*, *viscida*, etc., while there are innumerable intermediate forms not worthy of varietal rank. *Riddellia tagetina* Nutt. becomes much more woolly farther westward, and *Engelmannia pinnatifida* Torr. and Gray more hairy and somewhat dwarfed.

Besides *Chrysopsis villosa* Nutt. a number of other species become so modified as to produce distinct varieties. *Petalostemon violaceus* Mx. changes into its dwarfed but stouter variety *tenuis* Coulter. *Oxybaphus nyctagineus* Sweet, becoming more and more hairy, finally produces the variety *pilosus* Gray (Barber County, Kans.). *Oenothera Hartwegi* Benth. becomes the variety *lavendulifolia* Wats., dwarfed and more hairy, and *Aster oblongifolius* Nutt. gives place to its dwarfed but stouter and more rigid variety *rigidulus* Gray.

Just so, species with thickened or hairy epidermis and fleshy, narrow leaves take the place of other species of the same genus farther westward in the sandy or desert regions. Soon after passing the 98th meridian we find *Astragalus mollissimus* Torr. and *A. lotiflorus* Hook. taking the place of other species of the genus, and they finally become the dominant astragali of southwest Kansas. These species are well known to be quite hairy. In my own experience the latter species is almost invariably the only one of the genus found in sand hills. *Astragalus pectinatus* Dougl. and *A. pictus* Gray, var. *filifolius* Gray, species with very narrow or finely dissected leaves, and *A. Parryi* Gray, a very hairy species, also become quite common, especially in eastern Colorado. *Lepachys Tagetes* Gray becomes dominant in place of *L. columnaris* Torr. and Gray in extreme southwestern Kansas, and *Oxybaphus hirsutus* Sweet replaces largely the other oxybaphi in the Neutral Strip. *Gaura villosa* Torr. already begins to replace other gauras in sand hills at Guthrie, Okla., and becomes quite common farther westward. *Solanum elaeagnifolium* Cav. becomes the dominant member of its genus in southwest Kansas and Neutral Strip. It has very much thickened whitish woolly leaves and epidermis. It also takes the place of *Solanum rostratum* Dunal in furnishing food for great numbers of the Colorado potato beetle in Barber County, Kans. *Oenothera albicaulis* Nutt., with sparsity of leaves and much-thickened stem and leaves, and *Oe. pinnatifida* Nutt., with finely divided leaves and hairy all over, become common in place of others of this genus in southwest Kansas and southwestward. *Gaillardia pinnatifida* Torr., almost before one recognizes the fact, appears in place of *G. pulchella* Foug., as the two species resemble each other very much, but the former is really more ashy pubescent, with leaves usually more finely divided. *Artemisia filifolia*

Torr. and *A. Wrightii* Gray replace other artemisias, and *Dalea nana* Torr. and *D. lanata* Spreng. are found common in place of other members of that genus. All of these have either finely dissected leaves or great wooliness, or both.

Of the sedges *Cyperus Schweinitzii* Torr. seems to be the most common in sandy wastes. From what I am able to learn from other sources, however, it is a species that seems to be quite generally distributed everywhere. In this connection it may be of interest to note a difference in habitat between *Cyperus Schweinitzii* Torr. and *C. Houghtoni* Torr., which two species have only recently been separated by Dr. Britton. (Bulletin Torr. Bot. Club, vol. xviii, p. 368.) I have noted both species in many places all over the Southwest, and, while the former is quite common in sandy wastes, I have never once noted *C. Houghtoni* in such localities.

Bouteloua hirsuta Lag. is the dominant grama grass in the Neutral Strip; and in western Texas and eastern New Mexico the "black grama" grass, *B. eriopoda* Torr., becomes quite common. Of the ferns *Cheilanthes Lindheimeri* Hook. is a good example of a characteristic western form. It is extremely villous to tomentose, found growing in abundance among the rocks of the mesas in the Cimarron cañons.

To name all other species characteristic of these sandy regions, taken at random from various genera and orders, would require a long list, which would probably be both needless and uninteresting. Hence I shall name only a few of the most striking examples: *Heliotropium convolvulaceum* Gray, a species covered with stiff, appressed hairs, which I have invariably found growing in almost pure sand; *Redfieldia flexuosa* Vasey, a grass with slender, rigid leaves, seemingly restricted even to "blow outs" in sides of sand hills; *Diplachne rigida* Vasey, a grass having, as the name implies, a very rigid, thickened stem and a few short, narrow, rigid leaves; *Hymenopappus flavescens* Gray, a species white tomentose, common in southwest Kansas and Neutral Strip; *Franseria discolor* Nutt., hispid hairy, in Seward County, Kans.; *Polypteris Texana* Gray, *Aplopappus rubiginosus* Torr. and Gray, and *A. divaricatus* Gray, all viscid-pubescent or woolly, with rather narrow leaves; *Krynitzkia Jamesii* Gray, and *K. crassisejala* Gray, both extremely rough, hispid, or tomentose, in southwest Kansas and southwestward; *Lycurus phleoides* HBK., a grass somewhat similar in texture to the grama grasses, among the mesas in Neutral Strip; *Portulaca pilosa* L., common in the Panhandle and in sandy wastes at Wichita, Kans.; *Biscutella Wislizeni* Benth. and Hook., a densely woolly crucifer, common in the Panhandle and found in southwest Kansas; *Eriogonum annuum* Nutt., *E. alatum* Torr., *E. lachnogynum* Torr., *E. Jamesii* Benth., in fact, nearly all the eriogonums of the Great Plains, all pubescent to densely tomentose, with few narrow leaves; besides all the various cacti, with fleshy stems and no leaves; the mentzelias, with rough, thickened leaves and hard stems; the aristidas, stipas, yuccas, etc.

It would seem to be a logical conclusion from the above facts that any species introduced into cultivation for use as forage plants, in these desert regions, ought to possess these same characters protecting them against too rapid transpiration if there is to be any hope at all of success without irrigation. Such grasses as *Uniola latifolia* Mx., or the cut-grass, *Leersia oryzoides* Swartz, for instance, would make utter failures. Fortunately the plants proper for such regions can usually be found among the native species, but if they *must* be introduced from abroad they should certainly be selected from places similar in soil and climate.

While the buffalo and grama grasses will probably continue to be, for general purposes, the mainstay of the Western ranchman, at least for many years to come, still it seems proper to note here a few other species that might be introduced into cultivation with success by the farmer, especially in the lower lands and river valleys, and that ought to receive a thorough test by our Western experiment stations. The United States grass station at Garden City, Kans., has probably already made a trial of some of these species that I shall mention, but I think not all of them.

Colorado blue-joint (*Agropyrum glaucum* R. and S.).—This is a very common species in southern Colorado and in Neutral Strip and extreme western Kansas. It makes excellent hay, and is one of the most valued grasses in the Cimarron cañons. How far it has been tested in cultivation I do not know, although I was informed that a ranchman of southern Colorado had produced a very good meadow from the seed obtained from a small plat raised the year before.

Broom grass (*Andropogon saccharoides* Swartz, and varieties).—A ranchman at Garrett, Okla., calls this and the following species the best grasses they have in the Cimarron cañons, and others have made similar statements. It is widely diffused all over the Southwest, from Wichita and Guthrie westward, but not very abundant, although increasing in abundance westward.

Panic grass (*Panicum obtusum* HBK.).—Sofar as I know, this grass has never yet even been mentioned as one worthy of cultivation; but, as far as its being relished by stock is concerned, experience points it out as an excellent grass, both for hay and grazing. Its actual nutritive value, of course, would have to be determined by chemical analysis. It affords a fair supply of foliage, large spikelets which ought to furnish good seed, matures rather early, and seems well adapted to the river valleys of the Plains. It ranges from Kingfisher westward, becoming rather common in the Neutral Strip.

Hall's broom grass (*Andropogon Hallii* Hack., and varieties).—This is quite stemmy, but furnishes good grazing and, if cut young, produces a good quality of hay. It is much like the common blue-stem (*Andropogon provincialis* Lam.), and is quite frequent in cañons as well as on uplands.

Switch grass (*Panicum virgatum* L.) is also a common and well-known grass in the cañons. The value of this grass for hay is also increased by early mowing. It is called a very good forage plant by the ranchmen.

Yellow foxtail (*Setaria glauca* Beauv.).—The ranchmen in the South Canadian cañons call this a very good grass for hay. I have seen them mowing it in considerable quantity. It is rather common there. It may possibly seem the more valuable simply because there is a lack of other good species.

PLANTS CHARACTERISTIC OF GYPSUM HILLS.

It seems to be pretty well understood that the meaning of the Indian word Oklahoma is "home of the red earth" (Okla=red, homa=home); which, if true, makes it a very appropriate name, since a large portion of the Indian Territory north of the South Canadian River is plainly distinguished by outcropping "red beds," which also extend northward into Barber, Pratt, Comanche, and Kingman counties, Kans.

Now, gypsum and salt are also associated with the "red beds," outcropping at the surface in the form of gypsum hills and salt marshes, especially along the valley of the Cimarron and in central Kansas. The gypsum deposits, being a little harder than the surrounding soil, have been left standing by the eroding action of streams until they have become very prominent hills, in some places forming what are called *glass mountains*, from the glistening appearance of the mica-like gypsum covering their sides.

All these gypsum hills invariably have their characteristic plants. The special characters of the plants are very much the same as those of the plants of sandy regions. This is explained by the fact that they have to contend with the same general adversities of environment—a dry, gravelly soil, from which the water is rapidly drained away through the sides of the hills.

At the summits of these hills, near Kingfisher, Okla., certain species are found which do not occur in the surrounding lower country within a radius of 100 miles, so far as my experience goes. Of these, *Riddellia tagetina* Nutt. is one of the most common, found on various hills along the Cimarron River. The dwarf form of *Oenothera serrulata* Nutt., already mentioned, is also quite as common, as well as *Oc. Hartwegi* Benth., *Gaura villosa* Torr., *Yucca angustifolia* Pursh, *Gilia longiflora* Don., *Mentzelia nuda* Torr. and Gray, and *M. oligosperma* Nutt., are frequent on gypsum hills from Caldwell to Barber County, Kans. *Portulaca pilosa* L. occurs on similar hills in the Cherokee Outlet, Ind. T.

The following species I have not seen in other localities than gypsum hills: *Lesquerella gracilis* Wats., *Nama demissum* Gray, and *Astragalus microlobus* Gray, in Cherokee Outlet, and *Oxybaphus nyctagineus* Sweet, var. *pilosus* Gray, in Barber County, Kans. I suppose, however, they may be found, in other places. They are not very common, and this

fact may possibly account for my not having seen them in other localities. Of course it is not necessary that any species should be entirely limited to a certain locality in order to be properly characteristic of that locality.

PLANTS CHARACTERISTIC OF SALT MARSHES.

Experiments have shown that solutions of salt have a retarding influence upon the assimilative processes in plants; and now in a recent contribution to botanical science ("Ueber Schutzmittel des Laubes gegen Transpiration besonders in der Flora Javas," A. F. W. Schimper; Sitzungsberichte der Berl. Akadem. der Wissenschaften, 1890, S. 1045), the writer maintains that the presence of salt also interferes with the water supply, much to the same extent as a relatively dry soil. Hence it is argued that the thick, fleshy leaves, sunken stomata, and hairiness of salt-marsh plants are all protective characters against too rapid transpiration, just as they are in the case of plants of desert regions. If this view is correct, there are probably other characters distinguishing salt-marsh plants from those of desert regions, for I have yet noted but two species that are at all common to both localities.

The two species that I have found to be common to salt marshes and barren sandy regions are *Corispermum hyssopifolium* L. and *Cycloloma platyphyllum* Moq., belonging to the goosefoot order (*Chenopodiaceæ*). The former I have collected in abundance in sandy districts in Texas Panhandle and various places in southwest Kansas and in salt marshes all along the Salt Fork, in Cherokee Outlet; the latter, in a number of Kansas salt marshes, and in sandy wastes in extreme southwestern Kansas, where it is a common tumble weed.

Atriplex expansa Wats., belonging to the same order to which the above belong, is a common alkali and salt marsh plant in southern Kansas, although this is its first publication as a Kansas plant. It is also common along the Salt Fork in Indian Territory. It is well known to possess thick, scurfy leaves. *Kochia Americana* Wats., another member of the goosefoot order, and possessing unusually thick, terete, fleshy leaves, is also a common salt-marsh plant throughout southern and western Kansas. I have myself found it at Wichita and in salt marshes at Geuda Springs (Sumner County) and in Stafford County. It is according to my experience that a majority of the genera of the orders *Chenopodiaceæ* and *Amarantaceæ* represented in the Great Plains furnish species peculiar to salt marshes and sandy wastes.

Of the sedges *Scirpus maritimus* L. and *Scirpus Torreyi* Olney are invariably found associated with salt marshes throughout Kansas and Indian Territory. *Distichlis maritima* Raf., var. *stricta* Thurber, and *Sporobolus airoides* Torr. are such common grasses in salt marshes that it would be quite strange to see a salt marsh without them. The latter is also found in various alkaline and other barren soils.

Sesuvium portulacastrum L., belonging to an order (*Ficoideæ*) characterized by fleshy, succulent plants, is very frequent in Kansas salt marshes and on the Great Salt Plain of the Cimarron, and is strictly characteristic of such localities, according to my observations. *Glaux maritima* L. is also reported from Kansas and known to be a characteristic salt-marsh plant. I have not observed it myself.

Cleomella angustifolia Torr. is common in alkaline soils, but not at all limited to such localities.

PLANTS CHARACTERISTIC OF SANDSTONE OUTCROPS.

In the central and eastern portions of the Indian Territory are small surface outcrops, usually of sandstone, at the summits or on sides of hills, or even scattered over the general level of the country, which are always clothed by a vegetation entirely distinct from that of the surrounding soil. But I have only observed this peculiarity in the Indian Territory, and probably have not yet the required facts to make it a matter of very much importance.

I shall name a few of the species most strikingly characteristic of these localities that have come under my observation. These outcrops are especially noticeable about Guthrie and Oklahoma City, where I have collected the following species: *Nama hispidum* Gray, *Evax proli-fera* Nutt., *Euphorbia peplidion* Eng., *Linum Berlandieri* Hook., and several others of less importance. In these same outcrops and in the eastern part of the Territory I have collected some others, which are also found in the western Great Plains, such as *Actinella linearifolia* Torr. and Gray, and *Evolvulus argenteus* Pursh, both at Oklahoma City, and *Oenothera linifolia* Nutt., *Rumex acetosella* L., *Phacelia parviflora* Pursh, *Phacelia strictiflora* Gray, and others, in the Creek Nation.

SYSTEMATIC AND ALPHABETIC INDEX TO NEW SPECIES OF NORTH AMERICAN PHANEROGAMS AND PTERI- DOPHYTES PUBLISHED IN 1892.

BY JOSEPHINE A. CLARK.

PREFATORY NOTE.

In conformity with the plan of the Index for 1891 both a systematic and an alphabetic enumeration of names is given, the former following, in both order and numbering, Durand's Index Generum Phanerogamorum. In the case of species or varieties described as new in the year 1892, the State or other general locality follows the reference, but in case of a mere change in the name of a plant that has been previously described no locality is given.

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 1653. *Trifolium flavulum* Greene, Pitt. ii. 223.—California.
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1815. *Vigna luteola angustifolia* Robinson, Proc. Amer. Acad. xxvii. 167.—Mexico.
 ——— *strobilophora* Robinson, Proc. Amer. Acad. xxvii. 167.—Mexico.
1910. *Cæsalpinia multiflora* Robinson, Proc. Amer. Acad. xxvii. 167.—Mexico.
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1997. *Acacia californica* Brandegee, Proc. Cal. Acad. ser. 2, iii. 221.—Lower California.
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2044. *Kunzia glandulosa* Greene, Pitt. ii. 299.
2054. *Fragaria americana* Britton, Bull. Torr. Club, xix. 222.
2055. *Potentilla eremica* Coville, Proc. Biol. Soc. Wash. vii. 76.—Nevada.
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2069. *Rosa virginiana arkansana* MacMillan, Metasp. Minn. Val. 304.
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 2533. *Lopezia angustifolia* Robinson, Proc. Amer. Acad. xxvii. 168.—Mexico.

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 2678. *Micrampelis leptocarpa* Greene, Pitt. ii. 282.—Southern California.

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 2871b. *Coulterophytum laxum* Robinson, Proc. Amer. Acad. xxvii. 169.—Mexico.

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 — *vaseyi* Porter, Bull. Torr. Club, xix. 128.—Tennessee.
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 — *desertorum* Coville, Proc. Biol. Soc. Wash. vii. 68.—California.
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 — *puberula monticola* Porter, Bull. Torr. Club, xix. 129.—Maine and New Hampshire.
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 4154. *Perezia michoacana* Robinson, Proc. Amer. Acad. xxvii. 179.—Mexico.
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 ——— *linearis rubricaulis* MacMillan, Metasp. Minn. Val. 419.
 4959. *Frasera tubulosa* Coville, Proc. Biol. Soc. Wash. vii. 71.—California.

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 4969. *Gilia maculata* Parish, Bull. Torr. Club, xix. 93.—California.
 ——— *setosissima punctata* Coville, Proc. Biol. Soc. Wash. vii. 72.—California.
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 ——— *peritylodes* Coville, Proc. Biol. Soc. Wash. vii. 75.—California.

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 5026. *Lappula deflexa americana* MacMillan, Metasp. Minn. Val. 440.
 ——— *redowskii pilosum* MacMillan, Metasp. Minn. Val. 441.
 5027. *Allocarya stricta* Greene, Pitt. ii. 231.—California.
Cryptanthe bartolomæi Greene, Pitt. ii. 232.—Lower California.
 ——— *kelseyana* Greene, Pitt. ii. 232.—Montana.
Plagiobothrys californicus Greene, Pitt. ii. 261.
 ——— *campestris* Greene, Pitt. ii. 282.

5056. *Lithospermum calcicola* Robinson, Proc. Amer. Acad. xxvii. 182.—Mexico.
 ——— *revolutum* Robinson, Proc. Amer. Acad. xxvii. 182.—Mexico.
 ——— *carolinense* MacMillan, Metasp. Minn. Val. 438.

CONVOLVULACEÆ.

5077. *Ipomœa carletoni* Holzinger, Contr. Nat. Herb. i. 211.—Indian Territory.
 ——— *ornithopoda* Robinson, Proc. Amer. Acad. xxvii. 183.—Mexico.
 5088. *Breweria mexicana floribunda* Villada, La Naturaleza, ser. 2. ii. 127.—Mexico.
 5104. *Cuscuta gronovii saururi* MacMillan, Metasp. Minn. Val. 430.

SOLANACEÆ.

5129. *Physalodes physaloides* Millspaugh, Fl. West. Va. 416.

SCROPHULARIACEÆ.

5215. *Pentstemon davidsonii* Greene, Pitt. ii. 241.—California.
 ——— *fruticosus* Greene, Pitt. ii. 239.
 ——— *montanus* Greene, Pitt. ii. 240.—Yellowstone Park.
 ——— *penstemon* MacMillan, Bull. Torr. Club, xix. 15.
 5218. *Collinsia arvensis* Greene, Pitt. ii. 252.—California.

BIGNONIACEÆ.

5467. *Tabebuia donnell-smithii* Rose, Bot. Gaz. xvii. 418.—Mexico.

ACANTHACEÆ.

5616. *Beloperone fragilis* Robinson, Proc. Amer. Acad. xxvii. 183.—Mexico.

VERBENACEÆ.

5660. *Leptostachya leptostachya* MacMillan, Metasp. Minn. Val. 442.
 5680. *Lippia lantanoides* Coulter, Contr. Nat. Herb. ii. 328.—Texas.

LABIATÆ.

5755. *Perilla ocymoides crispa* Millspaugh, Fl. West. Va. 424.
 5760. *Lycopus lucidus obtusifolius* MacMillan, Metasp. Minn. Val. 453.
 5765. *Koelia flexuosa* Millspaugh, Fl. West Va. 424.
 ——— *tullia* Millspaugh, Fl. West Va. 425.
 5780. *Acinos vulgaris* MacMillan, Metasp. Minn. Val. 451.
 5793. *Salvia clevelandi* Greene, Pitt. ii. 236.
 ——— *leucophylla* Greene, Pitt. ii. 236.
 ——— *mellifera* Greene, Pitt. ii. 236.
 ——— *mohavensis* Greene, Pitt. ii. 235.
 ——— *palmeri* Greene not Gray, Pitt. ii. 236.
 ——— *sonomensis* Greene, Pitt. ii. 236.
 ——— *spathacea* Greene, Pitt. ii. 236.
 5796. *Ramona polystachya* Greene, Pitt. ii. 235.
 5810. *Scutellaria integrifolia hyssopifolia* Millspaugh, Fl. West Va. 427.—West Virginia.
 5870. *Mirabilis augustifolius* MacMillan, Metasp. Minn. Val. 216.
 ——— *hirsutus* MacMillan, Metasp. Minn. Val. 217.
 ——— *nvctagineus* MacMillan, Metasp. Minn. Val. 217.

NYCTAGINACEÆ.

5874. *Bœrhaavia anisophylla paniculata* Coulter and Fisher, Bot. Gaz. xvii. 348.—Texas.
 5882. *Abronia carletoni* Coulter and Fisher, Bot. Gaz. xvii. 349.—Eastern Colorado.
 ——— *sulksdorffii* Coulter and Fisher, Bot. Gaz. xvii. 348.—Washington.

ILLECEBRACEÆ.

5898. *Neckeria aurea* Millspaugh, Fl. West Va. 327.
 ——— *flavula* Millspaugh, Fl. West Va. 327.
 ——— *glauca* Millspaugh, Fl. West Va. 327.
 ——— *micrantha* MacMillan, Metasp. Minn. Val. 255.

AMARANTACEÆ.

5960. *Gomphrena nealleyi* Coulter and Fisher, Bot. Gaz. xvii. 349.—Texas.
 ——— *pringlei* Coulter and Fisher, Bot. Gaz. xvii. 349.—Mexico.
 5961. *Frœlichia gracilis drummondii* Holzinger, Contr. Nat. Herb. i. 214.
 ——— *floridana* Holzinger, Contr. Nat. Herb. i. 197, 214.
 ——— *texana* Coulter and Fisher, Bot. Gaz. xvii. 350.—Western Texas.

CHENOPODIACEÆ.

5979. *Atriplex cordulata* Jepson, Pitt. ii. 304.—California.
 ——— *depressa* Jepson, Pitt. ii. 304.—California.
 ——— *fruticulosa* Jepson, Pitt. ii. 306.—California.
 ——— *trinervata* Jepson, Pitt. ii. 305.—California.
 ——— *verna* Jepson, Pitt. ii. 305.—California.
 6042. *Sarcobatus baileyi* Coville, Proc. Biol. Soc. Wash. vii. 77.—California and Nevada.

POLYGONACEÆ.

6070. *Eriogonum davidsonii* Greene, Pitt. ii. 295.—California.
 ——— *pringlei* Coulter and Fisher, Bot. Gaz. xvii. 351.—Arizona.
 ——— *texanum* Coulter and Fisher, Bot. Gaz. xvii. 350.—Western Texas.
 6084. *Polygonum alpinum foliosum* Small, Bull. Torr. Club, xix. 360.
 ——— *bistortoides linearifolium* Small, Bull. Torr. Club, xix. 352.
 ——— *ferrugineum incanum* Small, Bull. Torr. Club, xix. 359.
 ——— *hydropiperoides strigosum* Small, Bull. Torr. Club, xix. 355.—Canada, Indiana, and West Virginia.
 ——— *mexicanum* Small, Bull. Torr. Club, xix. 356.—Mexico.
 ——— *microspermum* Small, Bull. Torr. Club, xix. 366.
 ——— *phytolaccæfolium* Meisner in Small, Bull. Torr. Club, xix. 360.—California.
 ——— *pringlei* Small, Bull. Torr. Club, xix. 357.—Mexico.
 ——— *punctatum leptostachyum* Small, Bull. Torr. Club, xix. 356.
 6088. *Rumex geyeri* Trelease, Rev. Rumex, 78.

PIPERACEÆ.

6145. *Peperomia inquilina* Hemsley, Gard. chron. ser. 3, xii. 428.—Mexico and Guatemala.

LAURACEÆ.

6193. *Cinnamomum cinnamomum* Cockerell, Bull. Torr. Club, xix. 95.
 6195. *Persea persea* Cockerell, Bull. Torr. Club, xix. 95.

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6317. *Razoumofskyia douglasii abietinum* Greene, Fl. Fran. 341.—California.

EUPHORBIACEÆ.

6370. *Euphorbia carmenensis* Rose, Contr. Nat. Herb. i. 133.—Carmen Island.
 ——— *nealleyi* Coulter and Fisher, Bot. Gaz. xvii. 351.—Western Texas.
 ——— *polyphylla* Engelm. in Holzinger, Contr. Nat. Herb. i. 215.—Florida.
 ——— *strictior* Holzinger, Contr. Nat. Herb. i. 214.—Texas.
 6488. *Manihot manihot* Cockerell, Bull. Torr. Club, xix. 95.
 6504. *Ricinelia vaseyi* Coulter and Fisher, Bot. Gaz. xvii. 351.

JUGLANDACEÆ.

6695. *Scoria minima* MacMillan, Metasp. Minn. Val. 178.
 ——— *ovata* MacMillan, Metasp. Minn. Val. 178.

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6706. *Ostrya ostrya* MacMillan, Metasp. Minn. Val. 187.
 6708. *Quercus brittoni* Davis, Scient. Amer. Sept. 3, 1892, p. 145.—Staten Island, N. Y.
 6710. *Castanea castanea americana* Sudworth, Bull. Torr. Club, xix. 152.
 ——— *dentata* Sudworth, Bull. Torr. Club, xix. 153.
 ——— *dentata* Sudworth, Bull. Torr. Club, xix. 154.

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6756. *Leptorchis læselii* MacMillan, Metasp. Minn. Val. 173.
 6761. *Corallorhiza corallorhiza* MacMillan, Bull. Torr. Club, xix. 15.
 6906. *Odontoglossum platycheilum* Weathers, Gard. chron. ser. 3, xi. 587.—Central America.
 6992. *Gyrostachys romanzowiana* MacMillan, Metasp. Minn. Val. 171.
 7066. *Habenaria maritima* Greene, Pitt. ii. 298.—California.
 ——— *pringlei* Robinson, Proc. Amer. Acad. xxvii. 184.—Mexico.
 7088. *Cypripedium pusillum* Rolfe, Kew Bull. 1892. 211.—Florida.

IRIDACEÆ.

7226. *Tigridia pulchella* Robinson, Proc. Amer. Acad. xxvii. 184.—Mexico.
 7248. *Sisyrinchium thurrowi* Coulter and Fisher, Bot. Gaz. xvii. 352.—Texas.

AMARYLLIDACEÆ.

7337. *Agave decipiens* Baker, Kew Bull. 1892. 184.—Florida.
 ——— *engelmanni* Trelease, Rep. Mo. Bot. Gard. 1891. 167.—In cultivation.

LILIACEÆ.

7357. *Smilax rotundifolia crenulata* Small and Heller, Mem. Torr. Club, iii. 17.—North Carolina.
 7407. *Yucca hanburii* Baker, Kew Bull. 1892. 8.—Rocky Mountains.
 7431. *Anthericum serotinum* Baker in Engler, Bot. Jahrb. xv. beibl. nr. 35. 9.—Arkansas.
 7468. *Brevoortia venusta* Greene, Pitt. ii. 230.—California.
 7510. *Fritillaria coccinea* Greene, Pitt. ii. 250.
 ——— *linearis* Coulter and Fisher, Bot. Gaz. xvii. 352.—Dakota.
 ——— *recurva coccinea* Greene, Pitt. ii. 230.—California.

7553. *Trillium erectum declinatum* Millspaugh, Fl. West Va. 453.—West Virginia.

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7563. *Heteranthera dubia* MacMillan, Metasp. Minn. Val. 133.

XYRIDACEÆ.

7569. *Zyris montana* Ries, Bull. Torr. Club. xix. 38.—Montana

COMMELINACEÆ.

7588. *Tradescantia angustifolia* Robinson, Proc. Amer. Acad. xxvii. 185.—Mexico

JUNCACEÆ.

7611. *Cypcrella campestris multiflora* MacMillan Metasp. Minn. Val. 143.

PALMÆ.

7668. *Chamædorea stolonifera* Wendland in Hooker, Bot. Mag. cxviii. 7265.—Mexico.

LEMNACEÆ.

7859. *Grantia brasiliensis* MacMillan, Metasp. Minn. Val. 134.
 ——— *columbiana* MacMillan, Metasp. Minn. Val. 135.

ERIOCAULACEÆ

7891. *Eriocaulon bilobatum* Morong, Bull. Torr. Club. xix. 226.—Mexico.

CYPERACEÆ.

7923. *Cyperus diandrus elongatus* Britton, Bull. Torr. Club. xix. 226.—New York and New Jersey.
7934. *Scirpus americanus longispicatus* Britton, Trans. N. Y. Acad. xi. 78.—New Mexico and Colorado.
- *californicus* Britton, Trans. N. Y. Acad. xi. 79.
- *cylindricus* Britton, Trans. N. Y. Acad. xi. 79.
- *cyperinus eriophorum* Britton, Trans. N. Y. Acad. xi. 82.
- *mexicanus* Clarke, in Britton, Trans. N. Y. Acad. xi. 77.
- *nanus anachætus* Britton, Trans. N. Y. Acad. xi. 75.
- *peckii* Britton, Trans. N. Y. Acad. xi. 82.—New York and Connecticut.
- *sylvaticus microcarpus* MacMillan, Metasp. Minn. Val. 97.
- *triangularis* MacMillan, Metasp. Minn. Val. 99.
7955. *Rhynchospora alba macra* Clarke in Britton, Trans. N. Y. Acad. xi. 88.—Florida and Texas.
- *axillaris microcephala* Britton, Trans. N. Y. Acad. xi. 83.—New Jersey to Florida and Louisiana.
- *corniculata macrostachya* Britton, Trans. N. Y. Acad. xi. 84
- *patula* Britton, Trans. N. Y. Acad. xi. 84.
- *corymbiformis* Britton, Trans. N. Y. Acad. xi. 86.
- *corymbosa* Britton, Trans. N. Y. Acad. xi. 84.
- *cymosa compressa* Clarke in Britton, Trans. N. Y. Acad. xi. 91.
- *distans tenuis* Britton, Trans. N. Y. Acad. xi. 90.

- 7955. *Rhynchospora fuscoides*** Clarke in Britton, Trans. N. Y. Acad. xi. 89.
 ——— *glomerata discutiens* Clarke in Britton, Trans. N. Y. Acad. xi. 89.—
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 ——— *leptocarpa* Chapman in Britton, Trans. N. Y. Acad. xi. 88.—
 South Carolina, Florida, and Alabama.
 ——— *minor* Britton, Trans. N. Y. Acad. xi. 89.—New Hampshire and
 Massachusetts.
 ——— *intermedia* Britton, Trans. N. Y. Acad. xi. 87.
 ——— *schœnoides* Britton, Trans. N. Y. Acad. xi. 92.
 ——— *setacea* MacMillan, Metasp. Minn. Val. 104.
 ——— *tracyi* Britton, Trans. N. Y. Acad. xi. 84.
7988. *Carex bella* Bailey, Bot. Gaz. xvii, 152.—Colorado, Utah, and Arizona.
 ——— *herbariorum* Bailey, Bot. Gaz. xvii. 150.
 ——— *lupulina longipedunculata* Sartwell in MacMillan, Metasp. Minn.
 Val. 129.
 ——— *montanensis* Bailey, Bot. Gaz. xvii. 152.—British America.
 ——— *pringlei* Bailey, Bot. Gaz. xvii. 151.—Mexico.
 ——— *varia australis* Bailey, Bot. Gaz. xvii. 153.—Texas.
 ——— *xerantica* Bailey, Bot. Gaz. xvii. 151.—British America.

GRAMINEÆ.

- 7991. *Tripsacum floridanum*** Porter in Vasey, Contr. Nat. Herb. iii. 6; Bull. Torr.
 Club, xix. 130.—Florida.
 ——— *lemmoni* Vasey, Contr. Nat. Herb. iii. 6.—Arizona.
8020. *Andropogon argyræus tenuis* Vasey, Contr. Nat. Herb. iii. 12.—Texas.
 ——— *macrourus pumillus* Vasey, Contr. Nat. Herb. iii. 11.—Texas.
 ——— *mohrii* Hackel in Vasey, Contr. Nat. Herb. iii. 11.—Florida, Alabama,
 and Mississippi.
Chrysopogon wrightii Munro in Vasey, Contr. Nat. Herb. iii. 9.—Florida.
8045. *Paspalum drummondii* Vasey, Contr. Nat. Herb. iii. 18.—Florida and Texas.
 ——— *furcatum villosum* Vasey, Contr. Nat. Herb. iii. 16.—North Carolina,
 Florida, and Texas.
 ——— *læve brevifolium* Vasey, Contr. Nat. Herb. iii. 18.—Massachusetts to
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 ——— *pubiflorum glaucum* Vasey, Contr. Nat. Herb. iii. 19.
 ——— *setaceum ciliatifolium* Vasey, Contr. Nat. Herb. iii. 17.—Maryland
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8048. *Eriochloa longifolia* Vasey, Contr. Nat. Herb. iii. 21.
 ——— *punctata minor* Vasey, Contr. Nat. Herb. iii. 21.—Texas.
 ——— *sericea* Munro in Vasey, Contr. Nat. Herb. iii. 21.—Texas and New
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8050. *Panicum crus-galli muticum* Vasey, Contr. Nat. Herb. iii. 37.
 ——— *sanguinale simpsoni* Vasey, Contr. Nat. Herb. iii. 25.—Florida and
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8059. *Chamæraphis viridis* Millspaugh, Fl. West Va. 466.
8085. *Phalaris intermedia microstachya* Vasey, Contr. Nat. Herb. iii. 42.—Flor-
 ida to Texas.
 ——— *lemmoni* Vasey, Contr. Nat. Herb. iii. 42.—California.
8089. *Aristida californica fugitiva* Vasey, Contr. Nat. Herb. iii. 49.—Colorado.
 ——— *divergens* Vasey, Contr. Nat. Herb. iii. 48.—Texas to Arizona.
 ——— *floridana* Vasey, Contr. Nat. Herb. iii. 48.
 ——— *humboldtiana minor* Vasey, Contr. Nat. Herb. iii. 47.—Texas, Ari-
 zona to California.
 ——— *nealleyi* Vasey, Contr. Nat. Herb. iii. 45.—Texas.

- 8089. *Aristida palustris*** Vasey, Contr. Nat. Herb. iii. 45.—Florida.
 ——— *purpurascens minor* Vasey, Contr. Nat. Herb. iii. 46.—Southern States to Texas.
 ——— *purpurea californica* Vasey, Contr. Nat. Herb. iii. 47.—Texas to California.
 ——— *fendleriana* Vasey, Contr. Nat. Herb. iii. 46.
 ——— *micrantha* Vasey, Contr. Nat. Herb. iii. 47.—Texas.
 ——— *reverchoni angusta* Vasey, Contr. Nat. Herb. iii. 46.—Texas.
 ——— *simplicifolia texana* Vasey, Contr. Nat. Herb. iii. 44.—Texas.
 ——— *stricta condensata* Vasey and Scribner in Vasey, Contr. Nat. Herb. iii. 45.—Florida.
- 8090. *Stipa caduca*** Scribner in Vasey, Contr. Nat. Herb. iii. 54.—Montana.
 ——— *eminens andersonii* Vasey, Contr. Nat. Herb. iii. 54.—Lower California.
 ——— *pringlei* Scribner in Vasey, Contr. Nat. Herb. iii. 54.—Mexico and Arizona.
 ——— *lemmoni* Vasey, Contr. Nat. Herb. iii. 55.—California.
 ——— *stricta sparsiflora* Vasey, Contr. Nat. Herb. iii. 51.—Oregon and Washington.
 ——— *viridula lettermani* Vasey, Contr. Nat. Herb. iii. 50.
 ——— *minor* Vasey, Contr. Nat. Herb. iii. 50.
 ——— *pubescens* Vasey, Contr. Nat. Herb. iii. 50.—Nevada and Oregon.
- 8096. *Muhlenbergia capillaris trichopedes*** Vasey, Contr. Nat. Herb. iii. 66.
 ——— *dumosa* Scribner in Vasey, Contr. Nat. Herb. iii. 71.—Arizona, Mexico, and southern California.
 ——— *emersleyi* Vasey, Contr. Nat. Herb. iii. 66.—Arizona.
 ——— *huachucana* Vasey, Contr. Nat. Herb. iii. 69.—Arizona.
 ——— *parviglumis* Vasey, Contr. Nat. Herb. iii. 71.—Texas.
 ——— *pringlei* Scribner in Vasey, Contr. Nat. Herb. iii. 71.—Arizona.
 ——— *reverchoni* Vasey and Scribner in Vasey, Contr. Nat. Herb. iii. 66.—Texas.
- 8097. *Brachyelytrum aristosum glabratum*** Vasey in Millspaugh, Fl. W. Va. 469.—West Virginia.
- 8107. *Alopecurus pratensis alpestris*** Vasey, Contr. Nat. Herb. iii. 86.—Colorado, Idaho, and Montana.
- 8111. *Sporobolus asper drummondii*** Vasey, Contr. Nat. Herb. iii. 60.
 ——— *asperifolius major* Vasey, Contr. Nat. Herb. iii. 64.—Texas.
 ——— *auriculatus* Vasey, Contr. Nat. Herb. iii. 64.
 ——— *cryptandrus flexuosus* Thurber in Vasey, Contr. Nat. Herb. iii. 62.—Colorado, New Mexico, Arizona to Texas.
 ——— *minor* Vasey, Contr. Nat. Herb. iii. 60.—Virginia, Illinois, Missouri, South Carolina, and Texas.
 ——— *vaginæflorus* Vasey, Contr. Nat. Herb. iii. 60.—Maine to Texas.
- 8112. *Epicampes ligulata*** Scribner in Vasey, Contr. Nat. Herb. iii. 58.—Texas to Arizona, and Mexico.
- 8119. *Cinna pendula bolanderi*** Vasey, Contr. Nat. Herb. iii. 57.
 ——— *mutica* Vasey, Contr. Nat. Herb. iii. 57.—Oregon.
- 8120. *Agrostis alba minor*** Vasey, Contr. Nat. Herb. iii. 78.—United States.
 ——— *canina stolonifera* Vasey, Contr., Nat. Herb. iii. 73.—Oregon.
 ——— *densiflora* Vasey, Contr. Nat. Herb. iii. 72.
 ——— *arenaria* Vasey, Contr. Nat. Herb. iii. 72.
 ——— *littorale* Vasey, Contr. Nat. Herb. iii. 72.
 ——— *diegoensis foliosa* Vasey, Contr. Nat. Herb. iii. 74.
 ——— *hallii* Vasey, Contr. Nat. Herb. iii. 74.—Oregon, Washington, and California.

- 8021. *Agrostis hallii californica*** Vasey, Contr. Nat. Herb. iii. 74.—California.
 — ***howellii*** Scribner in Vasey, Contr. Nat. Herb. iii. 76.—Oregon.
 — ***microphylla major*** Vasey, Contr. Nat. Herb. iii. 58, 72.—California.
 — ***novæ-angliæ*** Vasey, Contr. Nat. Herb. iii. 76.
 — ***perennans æstivalis*** Vasey, Contr. Nat. Herb. iii. 76.—Illinois, Tennessee, and southward.
 — ***rossæ*** Vasey, Contr. Nat. Herb. iii. 76.—Wyoming.
 — ***rubra alpina*** MacMillan, Metasp. Minn. Val. 65.
8124. *Calamagrostis aleutica angusta* Vasey, Contr. Nat. Herb. iii. 80.—California.
 — ***canadensis dubia*** Vasey, Contr. Nat. Herb. iii. 80.
 — ***curtissi*** Vasey, Contr. Nat. Herb. iii. 85.
 — ***dubia*** Scribner in Vasey, Contr. Nat. Herb. iii. 80.
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 — ***montanensis*** Scribner in Vasey, Contr. Nat. Herb. iii. 82.—Montana.
 — ***pallida*** Vasey and Scribner in Vasey, Contr. Nat. Herb. iii. 79.—Washington.
 — ***robusta*** Vasey, Contr. Nat. Herb. iii. 82.
 — ***suksdorfii*** Scribner in Vasey, Contr. Nat. Herb. iii. 82.—British America and northwestern United States.
 — ***sylvatica americana*** Vasey, Contr. Nat. Herb. iii. 83.—British America and western United States.
 — ***longifolia*** Vasey, Contr. Nat. Herb. iii. 83.
 — ***tweedyi*** Scribner in Vasey, Contr. Nat. Herb. iii. 83.—Washington.
8205. *Phragmites phragmites* MacMillan, Metasp. Minn. Val. 73.
8207. *Sieglingia cuprea* Millspaugh, Fl. West Va. 471.
8212. *Eragrostis eragrostis* MacMillan, Metasp. Minn. Val. 75.
8250. *Scolochloa arundinacea* MacMillan, Metasp. Minn. Val. 79.
8252. *Panicularia americana* MacMillan, Metasp. Minn. Val. 81.
8279. *Hystrix hystrix* Millspaugh, Fl. West Va. 474.

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- 8309. *Pinus attenuata*** Lemmon, Mining and Scientific Press, Jan. 16, 1892; Gard. and For. v. 65.

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Agrimonia
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Agrostis
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 canina stolonifera.
 densiflora.
 densiflora arenaria.
 densiflora littorale.
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 howellii.
 microphylla major.
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- montanensis.
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- robusta.
- suksdorfii.
- sylvatica americana.
- sylvatica longifolia.
- tweedyi.

Callichroa

nutans.

Caltha

- leptosepala howellii.
- leptosepala rotundifolia.
- palustris arctica.
- palustris asarifolia.
- palustris flabellifolia.
- palustris parnassifolia.
- palustris typica.

Carprifolium

- hispidulum californicum.
- interruptum.
- ledebourii.
- subspicatum.

Cardamine

arenicola.

Carex

- bella.
- herbariorum.
- lupulina longipedunculata.
- montanensis.
- pringlei.
- varia australis.
- xerantica.

Castanea

- castanea americana.
- castanea dentata.
- dentata.

Cerastium

- arvense bracteatum.
- grande.

Chamaedorea

stolonifera.

Chamaeraphis

viridis.

Chrysopogon

wrightii.

Cinna

- pendula bolanderi.
- pendula mutica.

Cinnamomum

cinnamomum.

Claytonia
 nubigera.
 Cleome
 potosina.
 Cnicus
 excelsior.
 Collinsia
 arvensis.
 Coptis
 asplenium biternata.
 occidentalis howellii.
 Corallorhiza
 corallorhiza.
 Coulterophytum
 laxum.
 Crategus
 flexispina pubescens.
 Crotalaria
 anagyroides minor.
 Cryptanthe
 bartolomæi.
 kelseyana.
 Cuscuta
 gronovii saururi.
 Cyperella
 campestris.
 Cyperus
 diandrus elongatus.
 Cypripedium
 pusillum.
 Dalea
 dalea.
 trochilina.
 Delphinium
 hesperium hansenii.
 ornatum.
 variegatum apiculatum.
 Desmanthus
 fruticosus.
 Dianthera
 incerta.
 Dictyanthus
 tuberosus.
 Diervilla
 diervilla.
 Drymaria
 diffusa.
 Epicampes
 ligulata
 Epilobium
 minutum biolettii.
 nivium.
 subcaesium.
 Eragrostis
 eragrostis.

Eremnula
 howellii.
 Erigeron
 calva.
 heteromorphus.
 hyperboreus.
 leptophyllus.
 turneri.
 Eriocaulon
 bilobatum.
 Eriochloa
 longifolia.
 sericea.
 Eriogonum
 davidsonii.
 pringlei.
 texanum.
 Erysimum
 asperum perenne.
 inconspicuum.
 Eschscholtzia
 ambigua.
 Eupatorium
 lemmoni
 sessilifolium brittonianum.
 vaseyi.
 Euphorbia
 carmenensis.
 nealleyi.
 polyphylla.
 strictior.
 Flaveria
 anomala.
 Fragaria
 americana.
 Frasera
 tubulosa.
 Fritillaria
 coccinea.
 linearis.
 recurva coccinea.
 Frœlichia
 gracilis drummondii.
 gracilis floridana.
 texana.
 Geissolepis
 suædæfolia.
 Gentiana
 americana.
 linearis.
 Gilia
 maculata.
 setosissima punctata.
 Gomphrena
 nealleyi.

Gomphrena—Continued.

- pringlei.
- Gonolobus
 - suberiferus.
- Grantia
 - braziliensis.
 - columbiana.
- Grindeia
 - lanata.
 - patens.
 - robusta platyphylla.
 - rubricaulis maritima.
- Guazuma
 - guazuma.
- Gymnolomia
 - canescens.
- Gyrostachys
 - romanowiana.
- Habenaria
 - maritima.
 - pringlei.
- Hedysarum
 - mackenzii leucanthum.
- Hesperalcea.
 - malachroides.
- Heteranthera.
 - dubia.
- Heuchera
 - hapemani.
- Hoffmanseggia
 - canescens.
 - falcaria capitata.
 - falcaria demissa.
 - falcaria pringlei.
 - falcaria rusbyi.
 - falcaria stricta.
 - glabra.
 - intricata.
 - gladiata.
 - jamesii popinensis.
 - melanostieta greggii.
 - melanostieta parryi.
 - platycarpa.
 - texensis.
- Houstonia
 - fruticosa.
- Hydrangea
 - arborescens kanawhana.
- Hystrix
 - hystrix.
- Ipomœa
 - carletoni.
 - ornithopoda.
- Isomeris
 - arborea globosa.
- Jacksonia
 - dodecandra.

- Kœllia
 - flexuosa.
 - tullia.
- Kuhnistera
 - purpurea.
- Kunzia
 - glandulosa.
- Laciniaria
 - sqarrosa intermedia.
- Lagenaria
 - lagenaria.
- Lappula
 - deflexa americana.
 - redowskii pilosum.
- Lepidospartum
 - striatum.
- Leptorchis
 - loeselii.
- Leptostachya
 - leptostachya.
- Leptosyne
 - pinnata.
- Lespedeza
 - reticulata virginica.
- Lesquerella
 - argentea.
- Leuconymphaea
 - odorata.
- Linanthus
 - acicularis.
 - ambiguus.
 - androsaceus.
 - aureus.
 - bellus.
 - bicolor.
 - bigelovii.
 - bolanderi.
 - breviculus.
 - ciliatus.
 - ciliatus montanus.
 - demissus
 - dianthiflorus.
 - filipes.
 - grandiflorus.
 - harknessii.
 - jonesii.
 - lemmonii.
 - liniflorus.
 - parryæ.
 - parviflorus.
 - pharnaceoides
 - pusillus.
 - rattani.
 - rosaceus.
- Lippia
 - lantanooides.

Lithospermum
 calicicola.
 carolinense.
 revolutum.
Lobelia
 inflata simplex.
Lopezia
 angustifolia.
Lotus
 biolettii.
 sulphureus.
Lutkea
 hendersonii.
Lycopus
 lucidus obtusifolius. -
Manihot
 manihot.
Meibomia
 arizonica.
 canadense hirsuta.
 incana.
 lindheimeri.
 lineata polymorpha.
 obtus.
 paniculata angustifolia.
 paniculata pubens.
 tweedyi.
Melampodium
 longipilum.
Mentzelia
 reflexa.
Micranthus
 leptocarpa.
Mirabilis
 angustifolia.
 hirsutus.
 nyctagineus.
Muhlenbergia
 capillaris tricipedes.
 dumosa.
 emersleyi.
 huachuca.
 parviglumis.
 pringlei.
 reverchoni.
Myosurus
 aristatus sessiliflorus.
 breviscapus.
 breviscapus californicus.
 pringlei.
Myrrhis
 ambigua.
 aristata.
 brachypoda.
 nuda.

Nasturtium
 nasturtium.
Neckera
 aurea.
 flavula.
 glauca.
 micrantha.
Nelumbo
 nelumbo.
Odontoglossum
 platycheilum.
Oenothera
 fruticosa diffusa.
 fruticosa pilosella.
Oldenlandia
 pringlei.
Opuntia
 basilaris ramosa.
 bernardina.
Oreopanax
 sanderianum.
Ostrya
 ostrya.
Oxycoccus
 oxycoccus.
Panicularia
 americana.
Panicum
 crus-galli muticum.
 sanguinale simpsoni.
Paspalum
 drummondii.
 furcatum villosum.
 laeve brevifolium.
 pubiflorum glaucum.
 setaceum ciliatifolium.
Passiflora
 palmeri.
Pentstemon
 davidsonii.
 fruticosus.
 montanus.
 pentstemon.
Peperomia
 inquilina.
Perezia
 michoacana
Perilla
 ocymoides crispa.
Persea
 persea.
Phacelia
 namatostyla.
 perityloides.
Phalaris
 intermedia microstachya.

Phalaris—Continued.

lemmoni.

Phlox

kelseyi.

Phragmites

phragmites.

Physalodes

physaloides.

Pimenta

pimenta.

Pinus

attenuata.

Plagiobothrys

californicus.

campestris.

Platystemon

californicus crinitus.

denticulatus.

torreyi.

Pleurobolus

canadensis.

canescens.

dillenii.

grandiflorus.

nudiflorus.

paniculatus.

Polemonium

van-bruntiae.

Polygonum

alpinum foliosum.

bistortoides linearifolium.

ferrugineum incanum.

hydropiperoides strigosum.

mexicanum.

microspermum.

phytolaccæfolium.

pringlei.

punctatum leptostachyum.

Porophyllum

pringlei.

Potentilla

eremica.

purpurascens pinetorum.

Psacalium

strictum.

Psoralea

rigida.

Quercus

brittoni.

Ramona

polystachya.

Ranunculus

alismellus.

biolettii.

californicus canescens.

Ranunculus—Continued.

californicus cuneatus.

californicus latus.

californicus latilobus.

glaberrimus ellipticus.

lacustris terrestris.

macounii.

turneri.

Razoumofskya

douglasii abietinum.

Rhus

americanus.

hirta.

Rhynchospora

alba macra.

axillaris microcephala.

corniculata macrostachya.

corniculata patula.

corymbiformis

corymbosa.

cymosa compressa.

distanis tenuis.

fuscoides.

glomerata discentiens.

glomerata leptocarpa.

glomerata minor.

intermedia.

schœnoides.

setacea.

tracyi.

Ribes

rubrum.

Ricinella

vaseyi.

Robinia

neo-mexicana luxurians

Rosa

virginiana arkansana.

Rubus

odoratus columbianus.

Rumex

geyeri.

Rumfordia

connata.

Sabazia

michoacana.

Salvia

clevelandi.

leucophylla.

mellifera.

mohavensis.

palmeri.

sonomensis.

spathacea.

Sambucus
 callicarpa.
 maritima.
Sarcobatus.
 baileyi.
Saxifraga
 integrifolia sierræ.
Scirpus
 americanus longispicatus.
 californicus.
 cylindricus
 cyperinus eriophorum.
 mexicanus.
 nanus anachætus.
 peckii.
 sylvaticus microcarpus.
 triangularis.
Scolochloa
 arundinacea.
Scoria
 minima.
 ovata.
Scutellaria
 integrifolia hyssopifolia.
Senecio
 aureus pauperculus.
 millefolium memmingeri.
 ovatus.
 reniformis.
Sida
 acuta garekeana.
 barelayi.
 diffusa setosa.
 hederacea sulphurea.
 palmeri.
 spinosa salviaefolia.
Sidastrum
 quinquenervium.
Sieglingia
 cuprea.
Silene
 purpurata.
Sisyrinchium
 thurowi.
Smilax
 rotundifolia crenulata.
Solidago
 boottii yadkenensis.
 humilis microcephala.
 missouriensis fasciculata.
 nemoralis mollis.
 puberula monticola.
 roanensis
 speciosa erecta.
 speciosa pallida.

Spilanthes
 beccabunga parvula.
 disciformis.
Spiræa
 lucida rosea.
 pyramidata.
Sporobolus
 asper drummondii.
 asperifolius major.
 auriculatus.
 cryptandrus flexuosus.
 minor.
 vaginæflorus.
Stellaria
 verna.
Stellularia
 longipes.
Stipa
 caduca.
 eminens andersonii.
 pringlei.
 lemmoni.
 stricta sparsiflora.
 viridula lettermani.
 viridula minor.
 viridula pubescens.
Streptanthus
 biolettii.
 pulchellus.
Stylocline
 arizonica.
Sullivantia
 hapemani.
Symphoricarpos
 symphoricarpos.
Tabebuia
 donnell-smithii.
Taraxacum
 taraxacum.
Thalictrum
 cæsius.
 macrostylum.
Therefon
 aconitifolia.
Tigridia
 pulchella.
Tissa
 rubra perennans.
Tithonia
 brachypappa.
Tradescantia
 angustifolia.
Trautvetteria
 palmata coriacea.

Trifolium

flavulum.

virescens.

Trillium

erectum declinatum.

Tripsacum

floridanum.

lemmoni.

Tropæolum

binaculatum

Valeriana

albonervata

Verbesina

potosina.

Verbesina—Continued.

pringlei.

Vigna

luteola angustifolia.

strobilophora.

Viola

reptans.

Xanthocephalum

lucidum.

tomentellum.

Xyris

montana.

Yucca

hanburii.

III. ADDITIONS TO THE INDEX FOR 1891.

SYSTEMATIC.

RANUNCULACEÆ.

4. *Anemone*.

Syndesmon thalictroides Britton, Ann. N. Y. Acad. vi. 237.

POLYGALACEÆ.

542. *Polygala costaricensis* Chodat, Bull. Soc. Bot. Belg. xxx. 298.—Costa Rica.
—— *durandi* Chodat, Bull. Soc. Bot. Belg. xxx. 300.—Costa Rica.
—— *crassifolia* Chodat, Bull. Soc. Bot. Belg. xxx. 301.—Costa Rica.
—— *paniculata verticillata* Chodat, Bull. Soc. Bot. Belg. xxx. 302.—Costa Rica.
554. *Monnina costaricensis* Chodat, Bull. Soc. Bot. Belg. xxx. 304.—Costa Rica.
—— *crepini* Chodat, Bull. Soc. Bot. Belg. xxx. 302.—Costa Rica.
—— *pittieri* Chodat, Bull. Soc. Bot. Belg. xxx. 303.—Costa Rica.
—— *sylvicola* Chodat, Bull. Soc. Bot. Belg. xxx. 303.—Costa Rica.

ACERACEÆ.

1493. *Acer californicum* Greene, Fl. Fran. 76.

LEGUMINOSÆ.

1653. *Trifolium bifidum decipiens* Greene, Fl. Fran. 24.—California.
1682. *Tephrosia nitens lanata* Micheli, Bull. Soc. Bot. Belg. xxx. 286.—Costa Rica.
1702. *Cracca micrantha* Micheli, Bull. Soc. Bot. Belg. xxx. 286.—Costa Rica.
1994. *Mimosa pittieri* Micheli, Bull. Soc. Bot. Belg. xxx. 294.—Costa Rica.

ROSACEÆ.

2019. *Prunus*.
 Amygdalus andersonii Greene, Fl. Fran. 49.
 —— *fasciculata* Greene, Fl. Fran. 49.
2074. *Pyrus*.
 Sorbus occidentalis Greene, Fl. Fran. 54.

MELASTOMACEÆ.

2383. *Tibouchina cæstedii subsessiliflora* Cogniaux in D. C. Monogr. Phan. vii. 269.—Costa Rica.
2402. *Monochætum carazoi* Cogniaux in D. C. Monogr. Phan. vii. 401.—Costa Rica.
 —— *diffusum eglandulosa* Cogniaux in D. C. Monogr. Phan. vii. 395.—Guatemala.
 —— *vulcanicum* Cogniaux in D. C. Monogr. Phan. vii. 401.—Costa Rica.

2454. *Leandra costaricensis* Cogniaux in D. C. Monogr. Phan. vii. 658.—Costa Rica.
 ——— *fulva* Cogniaux, in D. C. Monogr. Phan. vii. 658.—Costa Rica.
 ——— *grandiflora* Cogniaux, in D. C. Monogr. Phan. vii. 690.—Costa Rica.
 ——— *lasiopetala* Cogniaux, Bull. Soc. Bot. Belg. xxx. 249.—Costa Rica.
 2459. *Conostegia bigibbosa* Cogniaux, Bull. Bot. Belg. xxx. 252.—Costa Rica.
 ——— *lanceolata subtrinervia* Cogniaux, Bull. Soc. Bot. Belg. xxx. 253.—Costa Rica.
 ——— *pittieri brevifolia* Cogniaux in D. C. Monogr. Phan. vii. 704.—Costa Rica.
 2462. *Miconia biperulifera rigida* Cogniaux in D. C. Monogr. Phan. vii. 1192.—Costa Rica.
 ——— *costaricensis pittieri* Cogniaux in D. C. Monogr. Phan. vii. 888.—Costa Rica.
 ——— *chrysoneura angustifolia* Cogniaux in D. C. Monogr. Phan. vii. 817.—Mexico.
 ——— *mexicana conostegioides* Cogniaux in D. C. Monogr. Phan. vii. 763.
 ——— *pedicellata* Cogniaux in D. C. Monogr. Phan. vii. 875.—Costa Rica.
 2468. *Maieta tocochoidea watsonii* Cogniaux in D. C. Monogr. Phan. vii. 979.—Guatemala.
 2470. *Clidemia purpureo-violacea* Cogniaux, Bull. Soc. Bot. Belg. xxx. 263.—Costa Rica.
 ——— *sessiliflora angustifolia* Cogniaux, Bull. Soc. Bot. Belg. xxx. 263.—Costa Rica.
 2472. *Bellucia costaricensis* Cogniaux, Bull. Soc. Bot. Belg. xxx. 264.—Costa Rica.
 2476. *Ossæa tetragona* Cogniaux, Bull. Soc. Bot. Belg. xxx. 265.—Costa Rica.
 2478. *Blakea gracilis longifolia* Cogniaux, Bull. Soc. Bot. Belg. xxx. 266.—Costa Rica.
 2479. *Topobea durandiana* Cogniaux, Bull. Soc. Bot. Belg. xxx. 268.—Costa Rica.

CUCURBITACEÆ.

- 2647a. *Pittiera longipedunculata* Cogniaux, Bull. Soc. Bot. Belg. xxx. 272.—Costa Rica.
 2658. *Corallocarpus emetocatharticus* Cogniaux, Bull. Soc. Bot. Belg. xxx. 279.
 2676. *Cyclanthera pauciflorum* Cogniaux, Bull. Soc. Bot. Belg. xxx. 276.—Costa Rica.
 ——— *pittieri* Cogniaux, Bull. Soc. Bot. Belg. xxx. 275.—Costa Rica.
 ——— *quinqueloba* Cogniaux, Bull. Soc. Bot. Belg. xxx. 276.—Costa Rica.
 ——— *tonduzii* Cogniaux, Bull. Soc. Bot. Belg. xxx. 274.—Costa Rica.
 2678. *Sicyos sertuliferus* Cogniaux, Bull. Soc. Bot. Belg. xxx. 277.—Costa Rica.
 2681. *Sicydium tamnifolium dussii* Cogniaux, Bull. Soc. Bot. Belg. xxx. 277.—Costa Rica.

ARALIACEÆ.

2941. *Didymopanax pittieri* Marchal, Bull. Soc. Bot. Belg. xxx. 280.—Costa Rica.

RUBIACEÆ.

3089. *Oldenlandia grayi* K. Schumann in Engler u. Prantl. Pflanzenfam. iv teil, 4 abt. 25.
 ——— *hookeri* K. Schumann in Engler u. Prantl. Pflanzenfam. iv teil, 4 abt. 25.

COMPOSITÆ.

3870. *Madia corymbosa* Greene, Pitt. ii. 218.

LABIATÆ

5793. *Salvia pittieri* Briquet, Bull. Soc. Bot. Belg. xxx. 237.—Costa Rica.
 5829. *Stachys costaricensis* Briquet, Bull. Soc. Bot. Belg. xxx. 240.—Costa Rica.

POLYGONACEÆ.

6084. *Polygonum polymorphum foliosum* Keller, Bull. Soc. Bot. Belg. xxx. 49.—Washington.
 ——— *sagittatum pubescens* Keller, Bull. Soc. Bot. Belg. xxx. 45.—New York.

ARISTOLOCHIACEÆ.

6135. *Aristolochia gigas sturtevantii* W. Watson, Gard. and For. iv. 546.—Guatemala.

PIPERACEÆ.

6141. *Piper bioleyi* C. De Candolle, Bull. Soc. Bot. Belg. xxx. 210.—Costa Rica.
 ——— *borucanum* C. De Candolle, Bull. Soc. Bot. Belg. xxx. 219.—Costa Rica.
 ——— *calvirameum* C. De Candolle, Bull. Soc. Bot. Belg. xxx. 200.—Costa Rica.
 ——— *carrilloanum* C. De Candolle, Bull. Soc. Bot. Belg. xxx. 209.—Costa Rica.
 ——— *chrysostachyum* C. De Candolle, Bull. Soc. Bot. Belg. xxx. 207.—Costa Rica.
 ——— *collostachyum* C. De Candolle, Bull. Soc. Bot. Belg. xxx. 212.—Costa Rica.
 ——— *dilatatum acutifolium* C. De Candolle, Bull. Soc. Bot. Belg. xxx. 217.—Costa Rica.
 ——— *discophorum* C. De Candolle, Bull. Soc. Bot. Belg. xxx. 201.—Costa Rica.
 ——— *dryadum* C. De Candolle, Bull. Soc. Bot. Belg. xxx. 221.—Costa Rica.
 ——— *fimbriulatum* C. De Candolle, Bull. Soc. Bot. Belg. xxx. 207.—Costa Rica.
 ——— *geniculatum longepetiolatum* C. De Candolle, Bull. Soc. Bot. Belg. xxx. 201.—Costa Rica.
 ——— *gibbosum* C. De Candolle, Bull. Soc. Bot. Belg. xxx. 212.—Costa Rica.
 ——— *hirsutum lævius* C. De Candolle, Bull. Soc. Bot. Belg. xxx. 204.—Costa Rica.
 ——— *pallescens* C. De Candolle, Bull. Soc. Bot. Belg. xxx. 201.—Costa Rica.
 ——— *parvifolium* C. De Candolle, Bull. Soc. Bot. Belg. xxx. 203.—Costa Rica.
 ——— *tonduzii* C. De Candolle, Bull. Soc. Bot. Belg. xxx. 203.—Costa Rica.
 ——— *nemorense* C. De Candolle, Bull. Soc. Bot. Belg. xxx. 222.—Costa Rica.
 ——— *neurostachyum* C. De Candolle, Bull. Soc. Bot. Belg. xxx. 213.—Costa Rica.
 ——— *nobile minus* C. De Candolle, Bull. Soc. Bot. Belg. xxx. 208.—Costa Rica.
 ——— *nudifolium* C. De Candolle, Bull. Soc. Bot. Belg. xxx. 205.—Costa Rica.
 ——— *otophorum* C. De Candolle, Bull. Soc. Bot. Belg. xxx. 220.—Costa Rica.
 ——— *peltaphyllum* C. De Candolle, Bull. Soc. Bot. Belg. xxx. 220.—Costa Rica.

- 6141. *Piper poasanum*** C. De Candolle, Bull. Soc. Bot. Belg. xxx. 206.—Costa Rica.
 ——— ***pseudo-velutinum flavescens*** C. De Candolle, Bull. Soc. Bot. Belg. xxx. 203.—Costa Rica.
 ——— ***psilocladum*** C. De Candolle, Bull. Soc. Bot. Belg. xxx. 211.—Costa Rica.
 ——— ***rufescens*** C. De Candolle, Bull. Soc. Bot. Belg. xxx. 218.—Costa Rica.
 ——— ***salinasanum*** C. De Candolle, Bull. Soc. Bot. Belg. xxx. 214.—Costa Rica.
 ——— ***sepicola*** C. De Candolle, Bull. Soc. Bot. Belg. xxx. 202.—Costa Rica.
 ——— ***subsessilifolium*** C. De Candolle, Bull. Soc. Bot. Belg. xxx. 216.—Costa Rica.
 ——— ***terrabanum*** C. De Candolle, Bull. Soc. Bot. Belg. xxx. 217.—Costa Rica.
 ——— ***umbricola*** C. De Candolle, Bull. Soc. Bot. Belg. xxx. 215.—Costa Rica.
 ——— ***vallicolum*** C. De Candolle, Bull. Soc. Bot. Belg. xxx. 222.—Costa Rica.
6145. *Peperomia borucana* C. De Candolle, Bull. Soc. Bot. Belg. xxx. 232.—Costa Rica.
 ——— ***calvicaulis*** C. De Candolle, Bull. Soc. Bot. Belg. xxx. 231.—Costa Rica.
 ——— ***cooperi*** C. De Candolle, Bull. Soc. Bot. Belg. xxx. 226.—Costa Rica.
 ——— ***costaricensis*** C. De Candolle, Bull. Soc. Bot. Belg. xxx. 228.—Costa Rica.
 ——— ***durandi*** C. De Candolle, Bull. Soc. Bot. Belg. xxx. 225.—Costa Rica.
 ——— ***palmana fragrans*** C. De Candolle, Bull. Soc. Bot. Belg. xxx. 233.—Costa Rica.
 ——— ***pittieri*** C. De Candolle, Bull. Soc. Bot. Belg. xxx. 235.—Costa Rica.
 ——— ***poasana*** C. De Candolle, Bull. Soc. Bot. Belg. xxx. 224.—Costa Rica.
 ——— ***reflexa pallida*** C. De Candolle, Bull. Soc. Bot. Belg. xxx. 235.—Costa Rica.
 ——— ***scutellata*** C. De Candolle, Bull. Soc. Bot. Belg. xxx. 230.—Costa Rica.
 ——— ***stenophylla*** C. De Candolle, Bull. Soc. Bot. Belg. xxx. 228.—Costa Rica.
 ——— ***vinasiana*** C. De Candolle, Bull. Soc. Bot. Belg. xxx. 231.—Costa Rica.

ORCHIDACEÆ.

- 6745. *Physosiphon guatemalensis*** Rolfe, Kew Bull. 1891. 197.—Guatemala.

FILICES.

- 25. *Cheilanthes albida*** Baker, Ann. Bot. v. 212.—Central Mexico.
 ——— ***longipila*** Baker, Ann. Bot. v. 211.—Central Mexico.
 ——— ***moncloviensis*** Baker, Ann. Bot. v. 210.—North Mexico.
38. *Asplenium chihuahuenae* Baker, Ann. Bot. v. 305.—Mexico.
44. *Nephrodium endresi* Baker, Ann. Bot. v. 329.—Costa Rica.
 ——— ***fournieri*** Baker, Ann. Bot. v. 317.
 ——— ***harrisoni*** Baker, Ann. Bot. v. 326.
 ——— ***nevadense*** Baker, Ann. Bot. v. 320.
48. *Polypodium blandum* Baker, Ann. Bot. v. 455.
48 ——— ***endresi*** Baker, Ann. Bot. v. 468.—Costa Rica.
 ——— ***eatonia*** Baker, Ann. Bot. v. 469.
50. *Notholæna schaffneri* Underwood in Davenport, Gard. & For. iv. 519.
 ——— ***mexicana*** Davenport, Gard. & For. iv. 519.
52. *Gymnogramme schaffneri* Baker, Ann. Bot. v. 484.
55. *Antrophyum minimum* Baker, Ann. Bot. v. 488.—Costa Rica.
60. *Acrostichum backhousianum* Baker, Ann. Bot. v. 491.

ALPHABETIC.

Acer
 californicum.
Acrostichum
 backhousiana.
Amygdalus
 andersonii.
 fasciculata.
Antrophyum
 minimum.
Aristolochia
 gigas sturtevantii.
Asplenium
 chihuahuense.
Bellucia
 costaricensis.
Blakea
 gracilis longifolia.
Cheilanthes
 albida.
 longipila.
 moncloviensis.
Clidemia
 purpureo-violacea.
 sessiliflora angustifolia.
Conostegia
 bigibbosa.
 lanceolata subtrinervia.
 pittieri brevifolia.
Corallocarpus
 emetocatharticus.
Cracca
 micrantha.
Cyclanthera
 pauciflorum.
 pittieri.
 pittieri quinqueloba.
 tonduzii.
Didymopanax
 pittieri.
Gymnogramme
 schaffneri.
Leandra
 costaricensis.
 fulva.
 grandifolia.
 lasiopetala.
Madia
 corymbosa.
Maieta
 cococoides watsonii.
Miconia
 biperulifera rigida.
 costaricensis pittieri

Miconia—Continued.
 chrysoneura angustifolia.
 mexicana conostegioides.
 pedicellata.
Mimosa
 pittieri.
Monnina
 costaricensis.
 crepini.
 pittieri.
 sylvicola.
Monochaetum
 carazoi.
 diffusum eglandulosa.
 vulcanicum.
Nephrodium
 endresi.
 fournieri.
 harrisoni.
 nevadense.
Notholana
 schaffneri.
 schaffneri mexicana.
Oldenlandia
 grayi.
 hookeri.
Ossaea
 tetragona.
Peperomia
 bornucana
 calvicaulis.
 cooperi
 costaricensis.
 durandi
 palmana fragrans.
 pittieri.
 poasana.
 reflexa pallida.
 scutellata.
 stenophylla.
 vinasiana.
Physosiphon
 guatemalensis.
Piper:
 biolleyi.
 bornucanum.
 calvirameum.
 carrilloanum.
 chrysostachyum.
 coilostachyum.
 dilatatum.
 discophorum.

Piper—Continued.

dryadum.
 fimbriulatum.
 geniculatum longepetiolatum.
 gibbosum.
 hirsutum levius.
 hirsutum pallescens.
 hirsutum parvifolium.
 hirsutum tonduzii.
 nemorense.
 neurostachyum.
 nobile minus.
 nudifolium.
 otophorum.
 peltaphyllum.
 peasanum.
 pseudo-velutinum flavescens.
 psilocladium.
 rufescens.
 salinasanum.
 sepicola.
 subsessilifolium.
 terrabanum.
 umbricola.
 vallicolum.

Pittiera

longipedunculata.

Polygala

costaricensis.
 durandi.
 durandi crassifolia.

Polygala

paniculata verticillata.

Polygonum

polymorphum foliosum.
 sagittatum pubescens.

Polypodium

blandum.
 eatonia.
 endresi.

Salvia

pittieri.

Sicydium

tannifolium dussii

Sicyos

sertuliferus.

Sorbus

occidentalis.

Stachys

costaricensis.

Syndesmon

thalioides.

Tephrosia.

nitens lanata.

Tibouchina

ærstedii subsessiliflora.

Topobea

durandiana.

Trifolium

bifidum decipiens.

IV. CORRECTIONS OF THE INDEX FOR 1891.

- p. 153. *Anemone tetonesis*, read *A. tetonensis*.
- p. 157. To *Hosackia sericea* Trelease in Branner and Coville, Bot. Geol. Surv. Ark., 1888, iv, 174, add, not Bentham.
- p. 159. *Rubus canadensis*, var. *roribaceus*, read *R. canadensis*, var. *roribaccus*.
Rubus sativus, read *R. villosus*, var. *sativus*.
Pyrus ivensis, read *P. ioensis*.
- p. 174. Strike out *Carex straminea*, var. *festucacea* Hitchcock, Trans. St. Louis Acad., v, 525.
- p. 183. Strike out *parvifolia* after *Miconia tonduzii*, var. *serrulata*, and add *M. tonduzii*, var. *parvifolia*.

NOTES ON SOME PACIFIC COAST GRASSES.

By GEORGE VASEY.

The grasses of California as described by Dr. Thurber in the Botany of California, second volume, are mostly models of accurate description. In some cases, however, and especially in the genera *Poa* and *Festuca*, Dr. Thurber in his conservative desire to make as few new species as possible made mistakes in trying to fit many really good new species to old names. I have been well satisfied of this for several years, but having recently had an opportunity of studying some of these grasses in the herbarium at Kew and in that of the British Museum, I am compelled to make several important changes. It appears to me that Dr. Thurber gave too broad definition to the genus *Atropis* (*Puccinellia* Parl.). The first and second species of his list probably belong in that genus, but *A. californica*, *tenuifolia*, *pauciflora*, and probably *scabrella* are, in my opinion, forms of *Poa*.

Poa abbreviata R. Br. Chloris Melv. 287 (1823), is a truly arctic grass, as noted hereafter, on page 270 under *Poa confinis*.

Poa stenantha Trin. Mem. Acad. St. Pet. ser. 6. i. 376 (1831) is an Alaskan species which has not, so far as I can find, been collected in California or in Washington, and the plant described by Dr. Thurber under that name is a very different species. It is probably *Festuca nervosa* Hook., which, however, is not a *Festuca*, but a *Poa*. I saw Hooker's type in the Royal Herbarium at Kew, and am satisfied that it should be *Poa nervosa* (Hook.) Vasey. See description on page 274.

Poa glumaris Trin. Mem. Acad. St. Pet. ser. 6. i. 379 (1831). It is evident that Dr. Thurber, in Bot. Cal. ii. 313, has confused this grass with *Poa kingii* Wats. Bot. King Surv., which is *Festuca confinis* Vasey, Bull. Torr. Club, xi. 126, and which would have been named *Festuca kingii* if its identity had been known at the time of its second publication. The two grasses are entirely distinct. *Festuca confinis* occurs throughout the Rocky Mountains, where *Poa glumaris* has not been found. *P. glumaris*, however, appears to be confined to the coast, and has not been collected so far south as Washington on the west side, but it occurs about Hudson Bay, in Labrador, in the islands of the St. Lawrence, and in Newfoundland.

Eragrostis alba Presl, Rel. Haenk. i. 279 (1828). None of the Californian specimens which I have seen under this name answer the description of Presl, but appear to be forms of the very variable *E. purshii*.

Festuca L. There are several good species of this genus in California which must have new names. The *F. gracillima* of Hooker, to which Dr. Thurber referred

one of them, is a South American grass of which I have seen authentic specimens in the Kew Herbarium and elsewhere, and is very different from the Californian plant, which I have named *F. viridula*. See description on page 279.

Festuca scabrella Torr. Bot. Cal. ii. 318 (1880). Dr. Thurber has here included at least two species. Neither of them appears to be the true *scabrella* as described and figured in Hooker's *Flora Boreali-Americana*, which is rather sparingly represented in our herbarium by specimens from British America, Montana, Colorado, and the mountains of the Gaspé, Lower Canada. What is probably a large variety of this species occurs in eastern Oregon and Washington, variety *major*. (See page 278.) Another species described under this name is a stout, tall grass of California and Oregon, which I have called *F. californica*. See description on page 277.

Festuca pauciflora Thunb. Fl. Jap. 52 (1784). The grass which Dr. Thurber described under this name is not that plant, as I ascertained by examination of the true *F. pauciflora* in the herbarium at Kew. The Californian plant described includes *Festuca occidentalis* Hook., and perhaps one or two other species.

It is difficult at the present time to decide as to the Hookerian species. The original description says: "Leaves principally radical, one-fourth the length of the culms, 3 or 4 on the culm, distant, but the culm is almost wholly concealed by their remarkably long, sheathing bases. Panicle 5-6 inches long; branches slender, again divided, more or less long, and more or less patent. Spikelets small in proportion to the size of the panicle, green, glossy, smooth. Awns about equal in length to the perianth [floral glume]. Glumes short and obtuse, especially the upper or inner one, which is about twice as long as the outer one, yet not half so long as the floral valves. Inner valves [palea] of the floret as long as the outer, acute, flat at the back, but the margins closely inflexed." The description also says: "Leaves, very narrowly linear-filiform;" also: "Glumes small, very unequal, obtuse and ciliate at the apex." Dr. Thurber, in Bot. Cal. ii. 318, has considerably modified the description, comments on the "obtuse" glumes, and refers to specimens communicated to the Torrey herbarium by Sir William Hooker, in which the glumes "would hardly be called obtuse." I have examined the specimens referred to, as also others in the Kew herbarium, and think they are some of the forms of *Festuca ovina* or *rubra*. One of the species which was probably included in Dr. Thurber's description of *F. pauciflora* Thunb. is what I have elsewhere described as *Festuca jonesii*. Another, which may also have been included under that name, is *Festuca ambigua*, described on page 277.

Elymus sibiricus L. Sp. Pl. i. 83 (1753). The species described by Dr. Thurber under this name is not the Linnæan plant, and is hereafter described as *E. glaucus* variety *tenuis*. (See page 280.)

DESCRIPTIONS OF NEW OR NOTEWORTHY GRASSES FROM THE UNITED STATES.

By GEORGE VASEY.

***Stipa hassel* sp. nov.** Culms very slender and wiry, densely tufted, more or less branching below, erect, 12 to 15 inches high; leaves narrowly linear, thread-like, setaceous, not rigid, 4 to 8 inches long, erect; ligule inconspicuous; upper leaf reaching nearly to the panicle; sheaths narrow, close, striate; panicle 2 to 3 inches long, narrow, loose, erect, slender; branches erect, mostly 2 or 3 together, unequal, the longer ones an inch or more in length, naked below, the others flowering to the base; spikelets small; empty glumes narrowly linear-lanceolate, acuminate, about $2\frac{1}{2}$ lines long, nearly equal, the lower 1-nerved, or indistinctly 3-nerved below, the upper strongly 3-nerved; floral glumes nearly as long as the empty ones, narrow, tapering to the apex, membranaceous (thinner than in most species of the genus), with 3 principal nerves, smooth; stipe short, with a few short hairs; palea one-half as long as its glume, acute; lodicules $\frac{1}{2}$ to $\frac{3}{4}$ line long; awn of the floral glume 8 or 9 lines long, bent above the middle, twisted below, nearly smooth; grain oblong, about 1 line long.

Dry ridges near Santa Monica, California. Type specimen collected in 1891 by Dr. H. E. Hassel, for whom it is named. It is nearly related to *Stipa eminens* variety *andersoni* Vasey, which is found in the same region.

***Orysopsis hendersoni* sp. nov.** Culms densely caespitose, 6 to 8 inches high; leaves crowded at the base, conduplicate, pungent, scabrous, rigid, one-half as long as the culms, lower sheaths rather loose; panicle 2 to 3 inches long, narrow, the branches mostly erect in pairs, the lower 1 to 2 inches long, naked except the 2 to 4 flowers near the apex; spikelets 2 lines long; empty glumes a little longer than the floral ones, broadly oblong, obtuse and toothed at the apex, the lower 3-nerved, the upper 5-nerved, both scarious above the middle; floral glume linear-oblong, nearly 2 lines long, smooth, coriaceous, obscurely 5-nerved, the apex formed of 2 lateral teeth, which appear to be on one side, the caducous, simple, curved awn 5 or 6 lines long, arising between the apical teeth; stamens 3, barbate.

Type specimen collected in Washington by L. F. Henderson, in 1892 (No. 2249). It is similar in appearance to *O. webberi* (Thurb.) Vasey and to small forms of *O. exigua* Thurb., but may be readily distinguished from either by its smooth florets.

***Muhlenbergia filiculmis* sp. nov.** Culms tufted, weakly erect, filiform, 7 to 10 inches high, leafless except near the base; radical leaves numerous, setaceous-filiform, 1 to $1\frac{1}{2}$ inches long; sheaths very short, the lower ones loose; ligule conspicuous, narrow, 1 line long; panicle spike-like, narrow, 1 to $1\frac{1}{2}$ inches long, the upper branches short, alternate, the lower ones inserted singly or in twos, naked near the base, each with 3 to 5 spikelets; spikelets small, 1 line or more long, with an awn about $\frac{1}{2}$ line long; empty glumes very thin, half as long as the floral glumes, the lower one ovate, acute, the upper broadly ovate, with 3 to 5 teeth at the apex; floral glumes oblong-linear, sparsely pubescent below,

3-nerved, with an awn about $\frac{1}{2}$ line long; palet equaling its glume and nearly as wide.

Type specimen collected by C. S. Sheldon on sandy soil, Ute Pass, Green Mountain Falls, El Paso County, Colorado, at 8,500 feet altitude, August 2, 1892 (No. 321). This species is nearest to *M. gracilis* variety *breviaristata* Vasey, but is more slender, with shorter leaves, shorter glumes, and shorter awns.

Sporobolus ligulatus Vasey & Dewey sp. nov. Perennial from a knotted rootstock; culms slender, smooth, simple, 12 to 18 inches high; basal leaves numerous, narrow, 1 line wide, 4 to 12 inches long, flat or convolute, scabrid or nearly smooth; culm leaves 2 or 3; sheaths equaling or exceeding the long internodes, the upper one extending nearly to the panicle; ligule 2 to 4 lines long, lacerate; panicle 4 to 6 inches long, narrow, erect or nodding, dark green; branches mostly single, erect or spreading, hispid, spikelet-bearing nearly to the base, $\frac{1}{2}$ to $\frac{3}{4}$ inch long; spikelets $1\frac{1}{2}$ to 2 lines long, narrow, subterete; empty glumes broadly lance-ovate, obtuse, nerveless, dark green, one-half as long as the floret, the second slightly larger; floral glume lance-oblong, subobtuse, smooth, 3- (or obscurely 5-) nerved; palet like the glume in texture, color, and size, with a narrow, obscure, membranaceous, marginal wing (usually involute) on each side of the apex.

Type specimen in the United States National Herbarium; collected by G. C. Nealley in Limpia Cañon, Presidio County, Texas, September, 1892 (No. 127). It is most nearly related to *S. jonesii* Vasey, but may be readily distinguished by its leafy culm and larger spikelets.

Calamagrostis arctica Vasey, Ill. N. A. Gr. ii. 55 (1893). Perennial; culms from a creeping rootstock, decumbent below, 6 to 10 inches high, the base covered with persistent, open, leafless sheaths; radical leaves rather rigid, 2 to 3 inches long, flat, smooth, 2 to 3 lines wide, the 1 or 2 cauline leaves with long, loose sheaths, smooth, the blades erect, flat or folded, about 1 inch long; ligule acute, 1 to $1\frac{1}{4}$ lines long; panicle spike-like, about 1 inch long, rather dense; the short branches spikelet-bearing to the base; spikelets 2 to $2\frac{1}{2}$ lines long, purplish; empty glumes ovate-lanceolate, attenuate-pointed, scabrous on the keel and nerves, the first 1-nerved, the second 3-nerved; floral glume elliptical-oblong, acutely 4-toothed at the broad apex, 4-nerved, about 2 lines long, the awn from near the base, $2\frac{1}{2}$ to 3 lines long, and extending conspicuously beyond the empty glumes; palet lanceolate, acuminate, 2-toothed at the apex, about equaling the floral glume; hairs of the callus and pedicel one-fourth as long as the floret.

Type specimen collected by J. M. Macoun, in 1891, at St. Paul Island, Bering Sea (No. 38). It bears some resemblance to *C. montanensis* Scribn., but is readily distinguished by the broader leaves and the short, purple panicle.

Bouteloua rothrockii sp. nov. Perennial, culms tufted, 15 to 20 inches high, erect, simple or sparingly branched, leafy nearly or quite to the panicle; leaves narrow, thinly pubescent near the base, 2 to 5 inches long; ligule short, ciliate; panicle 3 to 7 inches long, consisting of 5 to 9, nearly straight, erect, spreading or recurved spikes, which are commonly 1 to $1\frac{1}{2}$ inches distant, 1 to $1\frac{1}{2}$ inches long, and 2 lines wide, densely flowered; spikelets (including awns) 2 to $2\frac{1}{2}$ lines long; empty glumes unequal, oblong, mucronate or acute, the upper about 1 line long, the lower one-half as long; floral glume oblong, 4-lobed to the middle, villous on the nerves below, ciliate on the margins and apex, the awns from the sinuses one-half longer than the glume; palet nearly as long as its glume, wedge-oblong, 4-toothed or lobed above, with the two nerves extended into short awns; sterile pedicel hairy-tufted above, with 2 or 3 imperfect florets, and 3 awns as long as those of the perfect floret.

Type specimens collected at Cottonwood, Arizona, by Dr. J. T. Rothrock, in 1874 (No. 347), and distributed with Pringle's Arizona collection of 1884 as *B. polystachya* variety *major* Vasey. It is also found in New Mexico and northwestern

Mexico. It is readily distinguished from *B. polystachys* Benth. and *B. microstachys* (Fourn.) Vasey by its perennial, upright habit and the longer spikelets. All the lobes and the awns of the floral glumes are much larger than in *B. polystachys*, and the lateral lobes are larger than in *B. microstachys*.

Sieglingia wrightii sp. nov. Dioecious; culms erect or decumbent, from strong, creeping rhizomes, simple or branching, $1\frac{1}{2}$ to 2 feet high, leafy, rather stout; leaves of culm 5 to 8, those of the fertile culms 6 to 12 inches long, 2 to 3 lines wide, attenuate; lower sheaths shorter than the internodes, loose, smooth, the upper one near the panicle and equaling or exceeding it; pistillate panicle 5 to 8 inches long, linear-oblong, the branches mostly single, appressed, or the lower ones somewhat spreading, 2 inches long, spikelet-bearing throughout, somewhat spike-like, simple or compound at the base; spikelets large, 5 to 8 lines long, compact, nearly terete, 5- to 7-flowered, florets closely imbricated; empty glumes nearly equal, ovate-lanceolate, membranaceous, the lower 3-nerved, the upper 3- to 5-nerved, 4 to 5 lines long; floral glumes ovate, acute, slightly mucronate or entire, 4 to 5 lines long, rounded on the back, 3- to 5-nerved, coriaceous, with a broad, scarious margin; palet slightly shorter than its glume, thick, cartilaginous, curved, broad at the base, narrowed above, the nerves wing-margined and ciliate-scarious; styles 2, thick, protruding from the apex of the infolded palet; ovary not matured in the specimens seen; staminate plants as seen mostly smaller, with shorter and narrower panicles, shorter, compressed spikelets, and thinner glumes, the palet membranaceous.

It was first collected in Texas or New Mexico by C. Wright and is No. 2038 of his collection, distributed as *Tricuspis albescent* Munro, from which it is very different. It has since been collected (in 1891 and 1892) in Presidio County, Texas, in two distinct localities by Mr. G. C. Nealley; one of the localities furnishing staminate plants and the other pistillate. It is the only dioecious species known in the genus, and differs from the usual generic characters in wanting the lateral teeth of the floral glumes and the pubescent lateral nerves and callus, and in the very large cylindrical spikelets and large florets. Still its affinities seem to be with the genus. The staminate form has been described as *Poa texana* Vasey, Contr. Nat. Herb. ii. 60 (1890).

Eragrostis orcuttiana sp. nov. Apparently annual, culms 2 to 3 feet high, nearly simple, or branching below, smooth, rather stout; leaves flat or becoming somewhat involute, 3 to 6 inches long, 2 to 3 lines wide, acuminate, scarious on the margins; sheaths shorter than the internodes, smooth; ligule very short, ciliate; panicle spreading, 7 to 11 inches long, when expanded triangular in outline; general rachis smooth, without hairs at the axils; branches scattered or the lower sometimes somewhat verticillate, subdivided nearly to the base, compound, very floriferous; spikelets lead-colored, on capillary pedicels mostly shorter than themselves, narrowly linear, about 3 lines long, 7- to 9-flowered; empty glumes purplish, lanceolate, acute, shorter than the floral glumes, which are about 1 line long, acute, the lateral nerves prominent; palet slightly shorter than the glume, narrow, 2-toothed at the apex, finely scarious on the keel.

Type specimen collected at San Diego, California, by C. R. Orcutt, in 1885 (No. 1313), and others at San Bernardino, California, by S. B. Parish. Well distinguished by its large, many-flowered panicle and slender spikelets. It is most nearly related to *E. mexicana* Link.

Melica inflata sp. nov. Culms bulbous at the base, rarely caespitose, 3 to 6 feet high, erect, terete, smooth, and leafy; leaves 6 to 10 inches long, 1 to 2 lines wide; ligule conspicuous, lacerate; panicle 6 to 10 inches long, the branches distant, the lower in pairs, one short and few-flowered, erect, the other 1 to 3 inches long, naked below, bearing 2 to 4 spikelets and spreading; spikelets oblong, 6 to 9 lines long, cylindrical at first (?), 6- to 8-flowered, the florets closely imbricated; empty glumes oblong, subacute, the lower 3- to 5-, the upper 5- to 7-nerved;

floral glumes oblong-lanceolate, scabrous, about 4 lines long, subacute, the middle nerve shortly excurrent; palet one-third shorter, obovate-oblong, somewhat scabrous, ciliate above.

This is very nearly the description of Bolander under *M. poaoides* variety *inflata* (Proc. Cal. Acad. iv. 101, 1869), and corresponds to his specimen numbered 6121, as referred to by him. It appears to be a good species, but was apparently overlooked by Dr. Thurber. His specimens were collected in the Yosemite Valley in 1856, and are the only ones I have seen except a few collected by Mr. J. G. Lemmon in 1889, near Mount Shasta, in northern California.

***Poa arida* sp. nov.** Culms from a creeping rootstock, 1 to 2 feet high, rather rigid, smooth, with 2 or 3 short, rigid, erect leaves $\frac{1}{2}$ to 2 inches long, or sometimes almost wanting; radical leaves 3 to 6 inches long, rigid, erect, flat, or becoming involute, pungently pointed, striate; ligule conspicuous, acute; sheaths of culm long, somewhat scabrous; panicle linear or oblong-linear, 3 to 6 inches long, rather dense, the rachis scabrous, or smooth near the base, branches mostly in twos or threes, erect or appressed, the lower $\frac{1}{2}$ to $1\frac{1}{2}$ inches long, spikelet-bearing nearly to the base; spikelets short-pedicel, rather crowded, 3 to $3\frac{1}{2}$ lines long, ovate-lanceolate, 5- to 9-flowered; empty glumes nearly equal, $1\frac{1}{2}$ to 2 lines long, nearly as long as the adjacent floral glumes, or shorter in few-flowered spikelets, membranaceous, rounded on the back, broadly ovate, subacute, obscurely 3-nerved, slightly scabrous, scabrous-margined; floral glumes oblong, rounded, obtuse, $1\frac{1}{2}$ to 2 lines long, scarcely compressed, pubescent on the back below the upper third, villous on the keel and marginal nerves near the base, scarious at the apex, obscurely 5-nerved; palet as long as its glume, sparsely pubescent on the keels and back; grain lance-oblong slightly triquetrous, about $\frac{1}{4}$ line long.

Type specimen collected by G. R. Vasey at Socorro, New Mexico, in 1881; other specimens collected in Utah, Colorado, Kansas, and northward to British America. This is *P. andina* Nutt., in Herb. Phila. Acad., fide F. Lamson-Scribner, but Nuttall's manuscript name is preoccupied by a Chilean species, *P. andina* Trin. It may be distinguished from *Poa fendleriana* (Steud.) Vasey by the smaller spikelets, smaller florets, and the pubescence between the nerves of the floral glumes.

***Poa bigelovii* Vasey & Scribn. sp. nov.** Annual; culms 6 inches to 2 feet high, weak when elongated, smooth; leaves short in arid situations, in moist ones 2 to 4 inches long, flat, 1 to 2 lines wide; ligule thin, membranaceous; panicle long and narrow, 2 to 6 inches long; branches rather distant, the lower in twos or threes, erect, spikelet-bearing mostly to the base; spikelets 3- to 5-flowered, 2 to 3 lines long, broadly oblong, compressed; empty glumes nearly as long as the floral ones, acute; floral glumes $1\frac{1}{2}$ to 2 lines long, oblong, subacute, villous on the keel and marginal nerves to the middle or above, sparingly webby at the base; palet one-third shorter than the glume.

Type specimen collected by A. Fendler in New Mexico in 1847 (No. 931). It is found in the arid districts from Texas to Lower California and northward to Colorado and Utah, springing up abundantly after the summer rains. It differs from *Poa annua* L. in the narrow panicle and the presence of a web at the base of the florets. In a few instances it has been distributed as *Poa annua* variety *stricta* Vasey. The name *P. bigelovii*, without description, is given in Vasey, Descr. Cat. Gr. 81 (1885).

***Poa confinis* Vasey, Ill. N. A. Gr. ii. 75 (1893).** Apparently dioecious; culms from a slender creeping rootstock, 5 to 10 inches high; leaves convolute, filiform-setaceous, those of the numerous radical tufts mostly equaling the culm, smooth, those of the culm similar, 1 to 4 inches long; ligule short, oblong, entire; the lower sheaths very loose; panicle oblong, 1 to 2 inches long, confined, the branches mostly short, erect, and appressed, the lower ones sometimes an inch long,

mostly in twos or threes, nearly smooth; spikelets 2 to nearly 3 lines long, 3- to 5-flowered; empty glumes ovate, acute, the upper as long as the floral ones, the lower one-fourth shorter; floral glumes ovate-lanceolate, $1\frac{1}{2}$ lines long, subacute, prominently 5-nerved, roughish pubescent, apex and upper part of margins scarious, sparsely hairy at the base.

Type specimen collected by T. J. Howell on the sandy ocean beach at Tillamook Bay, Oregon, in 1872 (No. 69). Other specimens have been collected on sandy shores of Columbia River, Oregon; Kitsap County, Washington; Vancouver Island; and Alaska. This has been taken for *Poa abbreviata* R. Br., which is a truly Arctic grass, 3 to 4 inches high, with the outer glumes longer, the floral glumes silky pubescent below and woolly-tufted at the base. I had an opportunity of studying the types of that species in the British Museum, and was satisfied of its difference from our plant.

***Poa cusickii* sp. nov.** Culms densely tufted, 12 to 18 inches high, smooth, rather slender, erect, with 2 distant, very short leaves, the lower one near the base; radical leaves numerous, filiform, $\frac{1}{2}$ line or less in width, not rigid, 3 to 5 inches long; cauline leaves 2 to 3, distant, with long sheaths and short (1 to 3 inches), erect, narrow blades; ligule thin, scarious, decurrent, about 2 lines long, subacute; panicle purple or green, oblong-pyramidal, 2 to 3 inches long, open, erect, branches short above, gradually longer below, the lower ones 1 to $1\frac{1}{2}$ inches long, in twos or rarely threes, unequal, filiform, erect-spreading, spikelet-bearing above the middle; spikelets 4 to 5 lines long, 3- to 5-flowered; empty glumes about 2 lines long, little more than one-half as long as the adjacent florets, acute, the upper 3-nerved, broadly scarious-margined; floral glumes $2\frac{1}{2}$ to 3 lines long, lanceolate, acute, scarious at the apex, 5-nerved, finely scarious-puberulent, not pubescent or webby at the base; palea nearly as long as its glume.

Type specimen collected by W. C. Cusick in Oregon in 1885 (No. 1219); other specimens collected in Oregon by Thomas Howell (No. 183); at Fossil Station, Wyoming, by G. W. Letterman (No. 137); also in Idaho by J. H. Sandberg. It approaches closely to *P. filifolia* Vasey, but has shorter leaves and a smaller, denser panicle.

***Poa filifolia* sp. nov.** Culms densely clustered, from a slender rootstock, erect, slender, 16 to 24 inches high, with 2 or 3 distant, narrow, short-bladed leaves; radical leaves abundant, filiform, 6 to 10 inches long, flaccid, erect; leaves of the culm 2 to 3, distant, with long sheaths, and short (1 to 3 inches), erect, filiform blades; ligule less than 1 line long, acute; panicle loose and flexuous, 3 to 4 inches long; branches capillary, scarious, rather distant, the lower in twos or threes, unequal, the longer about $1\frac{1}{2}$ inches long, with few spikelets near the extremity, naked below; spikelets compressed, 3 to 5 lines long, rather loosely 5- to 7-flowered, on filiform pedicels; empty glumes nearly equal, one-third shorter than the adjacent florets, lance-ovate, acute, broadly scarious-margined; floral glumes $2\frac{1}{2}$ to 3 lines long, lance-oblong, subacute, scarious at the apex, minutely scabrid throughout, slightly more so on the keel, intermediate nerves rather indistinct; palea nearly equaling the glume, scarious on the keels.

Type specimen collected by J. H. Sandberg on rocky banks of Hatwai Creek, Nez Perces County, Idaho, in 1892 (No. 138); also collected by Dr. Sandberg on basaltic slopes on Clearwater River, near Lewiston, Idaho (No. 86).

***Poa flexuosa robusta* var. nov.** Culms $2\frac{1}{2}$ to 3 feet high, with 4 or 5 leaves, slightly compressed below; the two or three leaves near the base 2 to 4 inches long, 2 to 3 lines wide, sheaths shorter than the internodes, the upper leaves 4 to 6 inches long, with long sheaths; ligule membranaceous, 1 to 2 lines long, obtuse; panicle large, 8 to 10 inches long, erect, with about 8 distant pairs of spreading branches, which are capillary, naked below the middle, sparingly branched and flowering above; spikelets $2\frac{1}{2}$ to $3\frac{1}{2}$ lines long, 3- to 5-flowered;

empty glumes about one-third shorter than the adjacent florets; floral glumes subacute, about 2 lines long, pubescent below and on the keel, with a thin web of hairs at the base.

Type specimen collected by George Vasey at an altitude of 8,000 to 9,000 feet in the mountains of Colorado in 1868 (No. 673); other specimens collected by M. E. Jones near Georgetown, Colorado. The spikelets are generally larger than in the typical eastern plant. It differs otherwise in the webby hairs at the base of the florets, and in the erect, not nodding panicle.

***Poa gracillima* sp. nov.** Culms densely tufted, 15 to 20 inches high, erect or ascending from the base, smooth; radical leaves mostly fine, flaccid, and spreading, 2 to 5 inches long; leaves of the culm 1 to 2 inches long, slender; panicle 3 to 4 inches long, open, ovate or pyramidal, erect; branches spreading, the lower in twos or threes or even fives, at 5 or 6 nodes, and single near the apex, the lower ones 1 to 2 inches long, capillary, naked below, rather few-flowered near the extremity; spikelets 3 to 4 lines long, about 5-flowered, the florets somewhat distant; empty glumes ovate-lanceolate, acute, unequal, shorter than the adjacent florets; floral glumes $1\frac{1}{2}$ to 2 lines long, obtuse or subobtuse, oblong to oblong-lanceolate, purplish, scarious at the apex, not much compressed, distinctly 5-nerved, sparsely puberulent, scabrous or pubescent on keel and nerves below, or nearly smooth.

Oregon and Washington to Idaho and Wyoming. Type specimen collected by W. N. Suksdorf on Mt. Adams, Washington, in 1882 (No. 33). There is considerable variation in this species, especially as to the spread of the panicle, some forms having a rather narrow, nodding panicle and approaching *Poa tenuifolia* Nutt.

***Poa grayana* sp. nov.** Culms loosely tufted, stoloniferous, 12 to 15 inches high, smooth; radical leaves 6 to 8 inches long, narrow, becoming involute, rather stiff; culm leaves about 3, 1 to 3 inches long, erect; ligule membranaceous, 1 or 2 lines long, obtuse; panicle 3 to 4 inches long, loose, drooping; the lower branches in pairs, rather distant, $1\frac{1}{2}$ to 2 inches long, spikelet-bearing near the apex, filiform and naked below; the few spikelets rather crowded near the ends of the branches, 3- to 5-flowered, about 3 lines long, purplish; empty glumes 2 lines long, nearly equaling or rarely exceeding the adjacent florets, broad, acute, smooth, scarious-margined; floral glumes lanceolate, subacute, mostly less than 2 lines long, the upper part scarious and smooth, the lower part villose-pubescent, with no webby hairs at the base.

Type specimen collected by H. N. Patterson, near Grays Peak, Colorado, in 1885 (No. 14).

***Poa hispidula* sp. nov.** Culms 15 to 18 inches high, stout, smooth, 2- or 3-leaved; leaves flat or becoming involute toward the apex, rigid, erect, 3 to 4 inches long, 1 to 2 lines wide; sheaths mostly shorter than the internodes, striate, smooth; ligule 1 to 2 lines long; panicle lance-oblong, 4 to 6 inches long, rather close, branches erect, mostly in threes or twos, the lower ones $1\frac{1}{2}$ to 3 inches long, somewhat scabrous, naked below, rather densely flowered above; spikelets large, about 3 lines long, about 3-flowered, on short pedicels; empty glumes lanceolate, acute, little shorter than the floral glumes, the upper ones 3-nerved, hispid on the keel; floral glumes villous on the keel and lateral nerves, sparsely pubescent between, 2 lines long, scarious at the subacute apex, marginal nerves prominent, with copious webby hairs at the base.

Type specimen collected at Shumagin Island, Alaska, in 1871-72, by M. W. Harrington; others at Copts Bay, Unalaska, by Dr. A. Kellogg; and on Bering Island, in 1891, by J. M. Macoun.

***Poa howellii* Vasey & Scribn.** in Vasey, Ill. N. A. Gr. ii. 78 (1893). Culms tufted, $1\frac{1}{2}$ to 2 feet high, leafy; leaves nearly equidistant, 2 to 3 inches long, 2 lines wide, about equaling the internodes, acute; sheaths striate, slightly scabrous; ligule 2 lines

long, thinly membranaceous; panicle long and narrow, 4 to 7 inches long, loose, the branches scabrous, subappressed or spreading during flowering, the lower branches in threes or fives, unequal, 1 to 3 or 4 inches long, the longest naked for the lower third or half, the shorter flowering nearly to the base; the spikelets small, rather crowded, 3- or 4-flowered, 2 lines long; empty glumes narrow, acute, smooth; floral glumes ovate-oblong, subacute, $1\frac{1}{2}$ lines long, herbaceous and distinctly 5-nerved nearly to the apex, sparsely pubescent all over, and thinly webbed at the base; palea one-fourth shorter than the glume, finely pubescent on the keels.

Type specimen collected in fir forests near Portland, Oregon, by T. J. Howell in 1881 (No. 25); also found in California, Washington, and Vancouver Island. It differs from *P. trivialis* L. in its weaker culms, longer panicle, and pubescent floral glumes.

Variety *microsperma* var. nov. Culms more slender, leaves narrower, panicle looser, its branches more capillary, and the spikelets smaller, about $1\frac{1}{4}$ lines long.

Type specimen collected by C. L. Anderson at Santa Cruz, California, in 1888 (No. 99); other specimens collected in Washington.

Poa kelloggii Vasey, Ill. N. A. Gr. ii. 79 (1893). Culms 2 to 3 feet high, from a long rootstock; lower leaves 6 to 12 inches long, 2 to 3 lines wide, rather numerous, the upper gradually shorter, thickish, rather rigid; ligule short, lacerate; panicle pyramidal, open, 5 to 6 inches long; branches mostly in twos at the rather distant nodes, slightly scabrous, the lower ones 2 to 3 inches long, erect-spreading, naked below the middle; spikelets rather few on the slender subdivisions, about 3-flowered, 3 to 4 lines long; empty glumes narrow, acute, unequal; floral glumes ovate-lanceolate, acute, prominently 5-nerved, $2\frac{1}{4}$ lines long, smooth, with a narrow, webby tuft at the base; palea slightly shorter than the glume; internode of rachilla smooth, about 1 line long. The base of the culm has the appearance of growing in swampy or wet soil.

Type specimen collected by H. N. Bolander in California in 1868 (No. 4705). It has the aspect of *P. alsodes* Gray, but with larger and less pubescent florets.

Poa laevis sp. nov. Apparently annual; culms tufted, pale, slender, erect, smooth, 2 to 3 feet high, with two or three distant leaves; radical leaves slender, narrow, 6 to 8 inches long, those of the culm shorter; ligule acute; sheaths smooth; panicle more or less elongated, narrow, rather loose, 5 to 8 inches long, sometimes interrupted below, erect; branches erect or appressed, mostly spikelet-bearing to the base, the lower in twos or threes, unequal, the longest 1 to 2 inches long; the spikelets linear, appressed and very short-pedicelled, 3 to 5 lines long, about 5-flowered; empty glumes nearly equal, linear-lanceolate, about as long as the lower florets, acute, thin, pale, and scarious, except on the minutely scabrous midrib; floral glumes 2 to $2\frac{1}{4}$ lines long, linear-oblong, subacute, rounded on the back, 5-nerved, minutely scabrous, slightly pubescent on the keel and marginal nerves near the base, the apex scarious and yellowish-tinged, in age somewhat erose; palea equalling its glume, scabrous on the keels.

Type specimen collected by F. Lamson-Scribner in Montana in 1883. Other specimens have been collected in the Rocky Mountains from Arizona and Colorado to Montana and British America.

Poa lettermani sp. nov. Dwarf, densely tufted, culms 2 to 4 inches high; leaves mostly radical, flat, 1 to 2 inches long, $\frac{1}{4}$ to 1 line wide, the lower sheaths wide and loose; ligule rather conspicuous, acute; cauline leaves 1 or 2, about 1 inch long; panicle $\frac{1}{4}$ to 1 inch long, oblong, rather dense; branches mostly in twos, short, erect, with 1 to 3 spikelets each; spikelets $1\frac{1}{4}$ to 2 lines long, 2- to 4-flowered, purplish; empty glumes nearly as long as the spikelet, exceeding the adjacent florets, oblong-lanceolate, acute, nearly equal, smooth; floral glumes 1 to $1\frac{1}{4}$ lines long, ovate-oblong, acute or subobtusely, obscurely nerved, smooth,

scarious at the apex; palet nearly equaling the glume, acutely 2-toothed at the acuminate apex.

Type specimen collected by G. W. Letterman on Grays Peak, Colorado, in 1885 (No. 7); also collected in the type locality at 11,000 to 14,000 feet by H. N. Patterson, J. H. Wibbe, and M. E. Jones; and on Mount Rainier, Washington, at 9,000 feet altitude, by C. V. Piper. Well distinguished by the long empty glumes (longer than the floral ones), and the perfectly smooth floral glumes.

***Poa lucida* sp. nov.** Perennial; culms tufted, $1\frac{1}{2}$ to 2 feet high, smooth; radical leaves 5 to 7 inches long, 1 to 2 lines wide, those of the culm about 3, 2 to 3 inches long; ligule white, membranaceous, 2 lines long, decurrent; upper sheaths long, smooth; panicle 4 to 6 inches long, narrow, 1 inch wide to half as wide or less, the branches mostly in twos or threes, the lower ones 1 to 2 inches long, erect or appressed, naked near the base; spikelets 3 to 4 lines long, 3- or 4-flowered, shining, pale green; empty glumes oblong, abruptly acute, unequal, $1\frac{1}{2}$ to 2 lines long, smooth, not much compressed, scarious at the apex and margins; floral glumes 2 lines long, linear-oblong, obtuse, rounded at the back, sparsely and minutely scabrous, slightly pubescent near the base of the keel and lateral nerves, scarious at the apex, 5-nerved; palet nearly equaling its glume.

Type specimen collected on mountain sides near Georgetown, Colorado, by H. N. Patterson in 1885 (No. 73). Other specimens collected near Graymont and Calloway Hill, Colorado, at altitudes of from 7,000 to 11,000 feet.

***Poa nervosa* (Hook.) Vasey, Ill. N. A. Gr. ii. 81 (1893).** Culms $1\frac{1}{2}$ to $2\frac{1}{2}$ feet high, rather slender, smooth; radical leaves narrowly linear, 6 to 10 inches long, those of the culm about 3, rather distant, erect, flat, 1 to 3 inches long, 1 to 2 lines wide; panicle 2 to 5 inches long; branches spreading or erect-spreading, the lower 2 to 5 together, filiform, naked below, few-flowered near the extremity, or the panicle often smaller and less spreading; spikelets 3- to 8-flowered, on pedicels of their own length or shorter, flattish, the florets usually rather distant on the slender (sometimes flexuous) rachilla, 2 to $2\frac{1}{2}$ lines long; floral glumes linear-lanceolate, prominently 5-nerved, minutely scabrous on the nerves, otherwise nearly smooth; palet about equaling its glume.

The type of this species is described and figured as *Festuca nervosa* in Hooker, Fl. Bor. Amer. ii. 251 (1840), and is an unusually loose-flowered form. This form was re-collected in 1871 near Portland, Oregon, by Elihu Hall, and Dr. Gray, in his determination of Hall's collection (Proc. Amer. Acad. viii. 409), referred it to *Poa stenantha* Trin., from which it really differs in many respects, as shown by specimens from the St. Petersburg herbarium and by many corresponding specimens since collected in Alaska. Dr. Gray also thought it probable that this was *Poa leptocoma* Trin., and Grisebach (Flora Rossica, iv. 373) places *Poa leptocoma* Trin. under *Poa stenantha* Trin. as a variety; but from descriptions and typical specimens from the herbarium of St. Petersburg I am convinced that both of those species are different from *Poa nervosa* (*Festuca nervosa* Hook.). The species as above described occurs in northern California, Oregon, Washington, Idaho, and Montana.

***Poa occidentalis* sp. nov.** Culms slenderly rooted, 2 to $2\frac{1}{2}$ feet high, somewhat compressed, leafy; leaves 5 to 6 on the culm, the lower ones 2 to 3 inches long, the others longer, the upper one 5 or 6 inches long and sheathing the base of the panicle; sheaths flattened, scabrous, mostly much longer than the internodes; ligule rather conspicuous, obtuse or subacute, scabrous on the outside; panicle large and loose, 6 to 12 inches long; branches distant, mostly in threes or the lower sometimes in fives, and 4 to 6 inches long, erect, becoming spreading, capillary, scabrous near the extremities, naked below the middle, the spikelets closely racemed and short-pedicled on the slender subdivisions; spikelets mostly 3-flowered, 2 to 3 lines long, light green; empty glumes acute, scarious-margined, unequal, the upper 3-nerved and scabrous on the keel, about one-fourth shorter than the adja-

cent floret; floral glumes oblong lanceolate, $1\frac{1}{2}$ to 2 lines long, 5-nerved, the intermediate nerves less distinct, slightly pubescent below and on the keel, sparingly villose or webbed at the base.

Type specimen collected at Las Vegas, New Mexico, by G. R. Vasey, in 1881; also collected near Albuquerque, New Mexico, by M. E. Jones, and in Utah by L. F. Ward. This species has been mentioned, without description, as *P. trivialis* variety *occidentalis* (Vasey, Descr. Cat. Gr. 85, 1885).

Poa orcuttiana Vasey, West An. Sci. iii. 165 (1887). Culms cespitose, about 2 feet high, terete, scabrous; radical leaves numerous, narrow, flaccid, about 6 inches long, scabrous; culm leaves 2 to 4 inches long, attenuate at the apex and like the sheaths scabrous, upper sheath long; ligule membranaceous, about 2 lines long, acute, becoming lacerate; nodes smooth; panicle 4 to 6 inches long, lax; branches somewhat appressed, the lower in threes, 1 to 3 inches long, the lower third part or more naked, numerous flowered above; spikelets very short-pedicel, linear-oblong, 5- to 9-flowered, 4 to 6 lines long; empty glumes nearly equal, $1\frac{1}{2}$ lines long, acute or acuminate, the upper 3-nerved, scarious-margined; floral glumes oblong, erose at the subacute apex, flattish on the back, scabrous, about 2 lines long, subcoriaceous, scarious tipped, slightly pubescent, below, 5-nerved; palet as long as its glume, acute, ciliate-scabrous on the keels.

Type specimen collected in Chollas Valley, near San Diego, California, by C. R. Orcutt, in 1884 (No. 1070); also found near Vallecito, northern Lower California, by C. R. Orcutt (No. 1440). The linear spikelets with rigid glumes give the panicle the appearance of an *Atropis*.

Poa pattersoni sp. nov. Culms low, densely tufted, 5 to 6 inches high, naked above, slender; radical leaves numerous, 2 to 3 inches long, very narrow, flat or conduplicate, smooth, lower sheaths loose; the culm leaves $\frac{1}{2}$ to 2 inches long; panicle dense, oblong, weakly erect or nodding; branches subappressed, mostly in twos, unequal, $\frac{1}{2}$ inch long or less, bearing 1 to 4 nearly sessile spikelets; spikelets 2 to 3 lines long, 2- to 3-flowered; empty glumes nearly as long as the floral ones, narrowly ovate-lanceolate, acute; floral glumes 2 lines long, purplish, acute, pubescent on the lateral nerves and keel below the middle, but not webbed; intermediate nerves very indistinct; palet three-fourths as long as the glume, pubescent on the keels.

Mountains of Colorado, near Grays Peak, 11,000 to 14,000 feet altitude; type specimen collected by H. N. Paterson in 1885 (No. 154). Similar to *Poa pringlei* Scribn., but with smaller spikelets and floral glumes pubescent. It differs from *Poa laxa* Haenke in the denser panicle, larger spikelets, and narrower glumes.

Poa pringlei Scribn. in herb. Culms tufted, 5 to 10 inches high from a rootstock, decumbent at base, then erect, slender, wiry, with about 2 leaves, the uppermost not reaching the middle; leaves mostly radical, 1 to 2 inches long, convolute, rigid, recurved; those of the culm with a very short or nearly obsolete blade; sheaths striate; ligule conspicuous, 2 lines long; panicle $\frac{1}{2}$ to 1 inch long, compact, oblong, the few branches mostly in pairs, appressed, and with one or two spikelets each; spikelets very short-pedicel, large for the plant, 3 lines long, mostly 2-flowered, oblong, turgid, purplish; empty glumes thin, membranaceous, ovate-lanceolate, nearly as long as the floral glumes, which are about 3 lines long, oblong-lanceolate, subacute, scarious at the apex, smooth, obscurely 5-nerved; palet a little shorter, acutely 2-toothed, broader at the base, scabrous on the keels.

Type specimen collected by C. G. Pringle near the headwaters of the Sacramento River, California, at 8,000 feet altitude, in 1882; a larger form collected by C. F. Sonne on Mount Stanford, in 1888; and a third form, with longer leaves (2 to 4 inches), by Mr. Suksdorf, on Mount Adams, Washington, in 1882, and on high mountains of southeastern Oregon, by Mr. Cusick, in 1885.

***Poa reflexa* Vasey & Scribn. sp. nov.** Culms 10 to 20 inches high, slender, erect, smooth, including the rachis and branches; leaves of the culm about 3, narrow or rather broad, acute, erect, 2 to 3 inches long; sheaths long, smooth, shorter than the internodes; ligule 1 line long, obtuse; panicle 2 to 4 inches long, pyramidal, with about 6 nodes; the branches capillary, rather distant, the lower ones 2 to 3 inches long, smooth, spreading and becoming reflexed, naked, spikelet-bearing near the ends; spikelets 2- or 3-flowered, $1\frac{1}{2}$ to 2 lines long; empty glumes lanceolate, acute, smooth, slightly shorter than the adjacent florets; floral glumes ovate-lanceolate, acute or subacute, obscurely nerved, pubescent on the midnerve and lateral nerves, with a narrow tuft of hairs at the base; palea pubescent on the keels.

Type specimen collected by G. W. Letterman on Kelso Mountain, near Torrey Peak, Colorado, in 1885. It grows at high altitudes on margins of streams, usually in wet, sandy or gravelly soil. Rocky Mountains, Colorado, northward to Montana, Washington, and British America. The long, smooth, reflexed capillary branches are characteristic of this species, and distinguish it from *Poa arctica* R. Br. with which it has been confused. A small form of *P. reflexa* is represented in Vasey, Ill. N. A. Gr. ii. Fig. 4, Pl. 71. The name without description appears in Vasey, Deser. Cat. Gr. 83 (1885).

***Poa sandbergii* sp. nov.** Culms tufted, 10 to 16 inches long, slender, upper portion naked, the lower portion bearing about 2 sheaths with very short blades; leaves mostly radical, 2 to 4 inches long, very narrowly linear, those of the culm about 2, the blade 1 inch long or less; ligule about 1 line long; panicle $1\frac{1}{2}$ to 3 inches long, sometimes very narrow, or less than 1 inch wide, the branches ascending nearly smooth, the lower in twos or threes, unequal, the longer one 1 to 2 inches long, spikelet-bearing above the middle; spikelets short-pedicel, 2- to 4-flowered about 3 lines long, often purplish; empty glumes lanceolate, subacute, about two-thirds as long as the adjacent florets; floral glumes linear-oblong, obtuse nearly 2 lines long, sparsely pubescent or puberulent, somewhat villose near the base but not webbed, scarious at the apex; palea equaling its glume, pubescent on the keels; internode of rachilla puberulent, $\frac{1}{2}$ line long.

Collected by J. H. Sandberg near Lewiston, Idaho, in 1892 (No. 164). Also found by other collectors in Washington and California. It approaches some forms of *Poa tenuifolia* Nutt., from which it may be distinguished by its smaller spikelets, shorter florets, and more pubescent floral glumes.

***Poa sheldoni* sp. nov.** Culms from a creeping rootstock, rather rigid, 8 to 10 inches high, smooth, having 3 or 4 leaves 1 to 2 inches long, rigid, erect, or somewhat curved; ligule short, acute; sheaths longer than the internodes, smooth, striate; radical leaves 2 to 3 inches long, rigid, conduplicate, curved; panicle narrow, $1\frac{1}{2}$ to 3 inches long, with 5 or 6 nodes; branches mostly in twos, erect, each with usually about 2 spikelets, the lower branches about 1 to $1\frac{1}{2}$ inches long, flowering above the middle; spikelets mostly short-pedicel, large for the panicle, erect, about 3 lines long, 3- to 4-flowered; empty glumes oblong-lanceolate, $1\frac{1}{2}$ to nearly 2 lines long, membranaceous, abruptly acute, smooth; floral glumes 2 lines long, oblong-lanceolate, subobtus, 5-nerved, with a short pubescence near the base, scarious at the apex and margins; palea ciliate-pubescent on the keels, nearly equaling the glume.

Type specimen collected in wet, sandy soil, along Cottonwood Creek, Buena Vista, Colorado, at 8,000 feet altitude, by C. S. Sheldon, July 4, 1892 (No. 615). This species approaches very closely some small forms of *Poa arida* Vasey, but may be distinguished by the less pubescent floral glumes.

***Poa tracyi* sp. nov.** Culms 2 to $2\frac{1}{2}$ feet high, rather stout, erect, slightly compressed; lower leaves short, 2 to 3 inches long, increasing in length above, the upper 4 to 5 inches long, erect, rather thick, acute, smooth; sheaths striate, smooth; ligule short, obtuse; panicle 6 to 10 inches long, 1 to 2 inches wide,

loose, the rather distant branches capillary, flexuous, erect-spreading, the lower in threes or fives, the upper in twos, at the 8 to 12 nodes of the smooth erect axis, 1 to 3 inches long, spikelet-bearing above the middle; spikelets somewhat clustered, on short pedicels, loosely 3- to 4-flowered, about $2\frac{1}{2}$ lines long; empty glumes oblong, subacute, smooth; floral glumes nearly 2 lines long, linear-oblong, obtuse, scarious at the apex, prominently 5-nerved, upper part somewhat scabrous, lower half white-pubescent, thinly webbed at the base; the whole plant grayish in color.

Type specimen collected on mountain sides at Raton, New Mexico, at an altitude of 7,000 or 8,000 feet, by S. M. Tracy, in 1887. It somewhat resembles *Poa reflexa* Vasey & Scribn., but is larger, with longer panicle, larger spikelets, and larger floral glumes.

***Festuca ambigua* sp. nov.** Perennial; culms 2 to 3 feet high, stout, the base clothed with numerous rather rigid leaves, 6 to 8 inches long, 1 to 2 lines wide, flat or becoming somewhat involute; the culm with about 4 leaves, the upper of which is 3 to 4 inches long, and the lower 6 to 8 inches, attenuate-pointed, smoothish, 2 lines wide, flat or becoming involute, the sheaths scabrous, longer than the internodes; ligule nearly obsolete; panicle 6 to 8 inches long, its nodes distinct; branches rather capillary, spreading and flexuous, rather one-sided, chiefly in pairs, the longer one (3 to 4 inches long) spikelet-bearing from the middle or below, the shorter one (1 to 2 inches) subdivided near the base, somewhat scabrous; spikelets purplish, loosely 3- to 4-flowered, the florets rather distant and spreading, the rachilla roughish pubescent, disarticulating at a point midway between the florets; empty glumes narrowly lanceolate, acute, the upper obscurely 3-nerved, 2 lines long, the lower little more than one-half as long; floral glumes 3 to 4 lines long, narrowly lanceolate, obscurely 5-nerved, sparsely scabrous, acuminate with 2 small, unequal teeth, awn 4 to 6 lines long; palea equalling its glume, bidentate and slightly ciliate at the apex.

Type specimen collected by T. J. Howell, in Oregon, in 1881 (No. 19); also collected in California by Kellogg and Harford (No. 1116), and at Santa Cruz, in 1888, by C. L. Anderson. A stout and rather handsome grass, the upper sheath about 10 inches long. The panicle is loose and drooping, and the long awns conspicuous.

***Festuca arizonica* sp. nov.** Culms tufted, firm, erect, about 2 feet high; leaves very numerous at the base, 3 to 5 on the culm, stiff, filiform-setaceous, scabrous-margined, the upper 2 or 3 with long sheaths, and blades 6 to 10 inches long, the upper one equalling or exceeding the panicle; ligule short, blunt, with prominent auricles; panicle narrow, 3 to 5 inches long; branches alternate, erect and appressed; the lower 2 to 3 inches long, subdivided from below the middle; spikelets about 5 lines long, appressed to the branches, lance-linear or oblong-linear, on very short pedicels, 4- to 5-flowered; empty glumes unequal, the first about 2 lines long, linear, 1-nerved; the second $2\frac{1}{2}$ to 3 lines long, acute or subobtuse, 3-nerved, scarious margined; floral glumes 3 to $3\frac{1}{2}$ lines long, thick, acuminate, with an awn $\frac{1}{2}$ to 1 line long, rather obscurely 5-nerved, rounded on the back below, slightly scabrous or nearly smooth; palea equalling its glume, obtuse, minutely scabrous on the keels.

Type specimen collected by S. M. Tracy near Flagstaff, Arizona, in 1887 (No. 118). Other specimens have been collected at various points in Arizona, New Mexico, and Colorado. Well marked by its long, setaceous leaves, narrow panicles, and pale, ashy color. It grows in pine woods, is commonly called "pine grass," and is said to be much sought by cattle.

***Festuca californica* sp. nov.** Culms 3 to 4 feet high, thick and stout, smooth, crowded below with leafless sheaths; radical leaves numerous, one-half as long as the culm, scabrous, rigid, flat or becoming involute; those of the culm 2 or 3, the upper 3 to 6 inches long; sheaths long, striate, more or less scabrous; ligule a villous

ring, the outer side and auricles also villous, or sometimes the ligule short, membranaceous, and not villous; panicle 6 to 12 inches long, spreading; branches mostly in pairs, the lower ones 3 to 5 inches long, capillary, the lower half or two-thirds naked, above with 3 to 6 large spikelets on pedicels as long to twice as long as themselves; the spikelets 6 to 9 lines long, about 5-flowered, compressed, the florets rather distant; empty glumes ovate-lanceolate, acute, the lower one-third shorter than the upper, which is more than 3 lines long and 3-nerved; floral glumes about 5 lines long, 5- to 7-nerved, minutely punctulate, scabrous, acute, narrowly scarious-margined, slightly pubescent at the apex, terminated with an awn 1 line long or less; palet about as long as its glume, acute, bifid at the apex; internode of rachilla thinly pubescent, 1 line long.

Type specimen collected on hills about Oakland, California, by H. N. Bolander, in 1862 (No. 1505); also collected in Oregon by T. J. Howell (Nos. 20 and 23). This species is described by Thurber as *Festuca scabrella* in Wats. Bot. Cal. ii. 318 (1880). It differs from Torrey's species in its much larger size, open panicle, and larger florets.

Festuca fratercula Rupt. Bull. Acad. Roy. Brux. ix. 326 (1842). Perennial; culms 2 to 3 feet high; leaves 6 to 8 inches long, 2 to 3 lines wide, flat, acuminate; sheaths shorter than the internodes; ligule nearly obsolete; panicle 4 to 6 inches long, spreading, nodding; lower branches in pairs, subdivided above the middle; spikelets mostly 3-flowered; empty glumes very unequal, the lower one small and one-half as long as the upper, which is lanceolate, 3-nerved, smooth, and more than 2 lines long; floral glumes 3 lines long, 3-nerved, nearly smooth, acuminate, usually terminating in a very short ($\frac{1}{2}$ line), weak awn; palet as long as its glume, scarious, minutely scabrous.

Collected in 1891 in the Rincon Mountains, Arizona, by G. C. Nealley (No. 177). I refer this with much doubt to the *F. fratercula* of Ruprecht, as cited by Fournier (Mex. Pl. ii, 124), but have seen no authentic specimens.

Festuca jonesii sp. nov. Culms variable, from slender to stout, 2 to 3½ feet high, smooth, leafy; leaves of culm 3 to 5, flat, 5 to 12 inches long, 2 to 4 lines wide, attenuate; sheaths shorter than the internodes; ligule short, obtuse; panicle ample, very open, 6 to 12 inches long, the branches mostly in pairs at the 5 to 8 distant nodes, slender, flexuous, 3 to 6 inches long, spreading, when old sometimes reflexed, divided near the middle; spikelets numerous, about $\frac{1}{2}$ inch long including the awns, 3- to 5-flowered; empty glumes narrowly lanceolate, unequal, the upper 2 to 2½ lines long, the lower one-third shorter, both attenuate; floral glume about 2½ lines long, lanceolate-acuminate, 3-nerved, minutely scabrous, terminated with a slender awn longer than the glume; palet equaling its glume, with 2 narrow teeth at the apex.

Type specimen collected by M. E. Jones in southern Utah in 1880. Other specimens have been collected from Utah and Idaho to the coast of California and Washington. It has sometimes been distributed as *Festuca occidentalis* Hook. Conspicuous from its spreading panicle, and long, often wide, flaccid leaves.

Festuca scabrella major var. nov. Culms closely tufted, stout, 2 to 3 feet high, rather rigid; radical leaves numerous, one-half as long as the culm, erect, rigid, scabrous, narrow, conduplicate or involute, many at the base breaking early from their sheaths; ligule very short, truncate, ciliate; panicle 5 to 9 inches long, narrow, loose, the branches mostly in rather distant pairs, erect, the lower 2 to 3 inches long, branching near the middle, with a few large, turgid spikelets 5 to 6 lines long, 2- to 4-flowered; empty glumes thin, membranaceous, the lower nearly 3 lines long, 1-nerved, the upper broader, 3-nerved below, nearly 4 lines long, both acute; floral glumes nearly 4 lines long, scabrous, punctulate, attenuate, acute, much thicker than the empty glumes, 5-nerved; palet one-fifth shorter than its glume, scabrous on the keels and near the bifid tip; internode of rachilla $\frac{1}{2}$ line long, hispidulous.

Type specimen collected by W. N. Suksdorf on prairies, Spokane County, Washington, in 1884 (No. 118); also collected in the Cascade Mountains, Washington, by G. R. Vasey in 1883 and 1889. It is said to be the common "bunch grass" of eastern Washington.

Festuca viridula Vasey, Ill. N. A. Gr. ii. 93 (1893). Culms 2 to 3 feet high, erect, rather slender, terete, smooth, naked above; radical leaves numerous, narrow, almost filiform, half as long as the culms, smooth; culm leaves 2 or 3; sheaths long, but shorter than the internodes; ligule a short, ciliate ring; blade 1 line wide or less, 2 or 3 inches long; panicle 4 to 6 inches long, open, of about 6 joints; branches erect, becoming spreading, few-flowered, the lower ones in twos, $1\frac{1}{2}$ to $3\frac{1}{2}$ inches long, capillary, naked below, and with but few (2 to 4) spikelets above; spikelets pale or purplish, 4- to 5-flowered, on short, slender pedicels; empty glumes unequal, the lower about 2 and upper nearly 3 lines long, and broader; floral glumes about 4 lines long, with a distinct callus at the base, linear-lanceolate, often denticulate near the acute or mucronate apex, minutely punctate-scabrous, or nearly smooth, rather indistinctly 5-nerved; palea equaling its glume, minutely ciliate at the obtuse apex.

Type specimen collected by W. N. Suksdorf on Mt. Adams, at 3,000 to 6,000 feet altitude, in 1882; other specimens collected in the Cascade Mountains, Oregon, and the Sierra Nevada, California. This is the *Festuca gracillima* of Thurber in Wats. Bot. Cal. ii. 318, but not of Hooker. The latter has a coarse culm, rigid, involute leaves, larger spikelets, and longer awns, and is a native of the southern hemisphere.

Agropyrum caninum (L.) R. & S. Syst. Veg. ii. 756 (1817). Culms $1\frac{1}{2}$ to 3 feet high, usually rather weak; spikes 3 to 6 inches long, usually rather flexuous and sometimes nodding, rather lax; spikelets, 3- to 5-flowered; empty glumes 5-nerved, extending into an awn 1 to 5 lines long; floral glumes 4 to 5 lines long, extended into an awn as long to twice as long.

Mountains of New England, Lake Superior region, and westward on high plains and mountains.

Our specimens are usually much larger and with longer and thicker spikes than the European ones; the awns varying much in length, some of them straight, others recurved-spreading, approaching *A. divergens* Nees. Many specimens also have a stiff, erect panicle.

Variety *unilaterale*. *A. unilaterale* Cassidy, Bull. Col. Agric. Exp. Sta. 12. 63 (1890). Culms usually much stouter, with rigid, erect spikes, the spikelets more or less one-sided on the rachis.

Type specimen collected by F. Lamson-Scribner in Montana in 1883 (No. 422).

In the Rocky Mountains from Colorado to British Columbia, as high as 8,000 feet altitude, and eastward on the high plains to central Nebraska and western Minnesota.

Agropyrum violaceum (Hornem.) Lange, Consp. Fl. Gr. 155 (1880). Culms 1 to $1\frac{1}{2}$ feet high; several from a common rootstock, or densely tufted, erect; leaves 4 to 6 inches long, $1\frac{1}{2}$ to 2 lines wide, tapering from near the base, somewhat scabrous; ligule very short or obsolete, sheaths smooth; spike 2 to 4 inches long, dense or sometimes lax, erect, tinged with purple or violet; spikelets 3- to 5- or 7-flowered; empty glumes 5 to 6 lines long, oblong or elliptical-lanceolate, terminating in a short cusp or sometimes in an awn as long as itself, conspicuously 5-nerved, usually with a narrow, scarious margin; floral glumes 4 to 5 lines long without the awn, 5-nerved, sparsely pubescent or scabrous on the nerves, terminating in an awn $\frac{1}{2}$ to 3 lines long; palea nearly as long as its glume, scabrous on the keels; internode of rachilla clavate, minutely pubescent, $\frac{1}{2}$ to 1 line long.

As will be inferred from the description, there is considerable variation in this species. The typical plant is always either alpine or found in high latitudes, especially in the Rocky Mountains, the White Mountains, or the Arctic regions. The Norwegian specimens are shorter than ours, with less dense spikes.

Variety *major* var. nov. Culms 2 to 3 feet high, rather slender; leaves longer than in the type, scabrous; spikes 4 to 9 inches long, erect, rather dense, but often slender; glumes mucronate or short-awned.

Type specimen collected in Oregon by W. C. Cusick in 1884 (No. 1134). Other specimens have been collected in the Rocky Mountains at lower altitudes than the species; also in the White Mountains and on the high plains of the West, and of British Columbia. Some specimens seem to run into *A. caninum* (L.) R. & S. Most of these plants look very different from the type; some have been distributed as *A. caninum* (L.) R. & S. and some as *A. tenerum* Vasey.

Elymus ambiguus Vasey & Scribn. sp. nov. Culms densely tufted, rigid, erect, leafy, about 3 feet high; leaves of radical tufts 1 to 1½ feet long, narrow and involute; leaves of the culm about 4, erect, rigid, 6 to 10 inches long; sheaths long, ligule very short; spikes 3 to 5 inches long, erect, rather densely flowered, rachis scabrous, usually with 2 spikelets at each joint, sometimes with single ones at the top and bottom of the spike; spikelets mostly twice as long as the joints of the rachis, 5- to 9-flowered, 6 to 9 lines long; empty glumes aristiform, about ½ line wide at the base, rigid, about 6 lines long, scabrous; floral glumes 5 to 6 lines long, terminating in 2 small, unequal teeth and a stiff awn 1 to 2 lines long, obscurely 5-nerved, puberulent or scabrous above; palea as long as its glume, bidentate at the apex; grain about 3½ lines long.

Type specimen collected by George Vasey at Pen Gulch, Colorado, in 1884. Other specimens have been collected at Fort Garland and Empire City, Colorado, and in Montana.

Elymus glaucus tenuis var. nov. (*E. sibiricus* Thurb. in Wats. Bot. Cal. ii. 326, non L.; *E. Americanus* Vasey & Scribn. in herb.) Culms 1½ to 3 feet high, rather slender; leaves usually narrow, 1 to 3 lines wide, 4 to 6 inches long, smooth or pubescent; spikes 3 to 6 inches long, narrow, with about 2 or sometimes but 1 spikelet at each joint; spikelets about 3-flowered, slightly exceeding the internodes, appressed; empty glumes narrowly lance-ovate, about 4 lines long, acuminate, 3-nerved; floral glumes 4 to 5 lines long, obscurely nerved, often purple, with a slender, divergent awn as long as the glume.

Type specimen collected by John Macoun on Vancouver Island in 1887 (No. 3); other specimens collected from British Columbia to Lower California and eastward to Arizona and Utah. Chiefly distinguished from the type by its narrower leaves and its weaker and fewer-flowered spikes. *E. sibiricus* L., to which Dr. Thurber referred our plant, is larger, with a more lax, bending spike, having larger spikelets and much more diverging and longer awns.

DESCRIPTIONS OF NEW GRASSES FROM MEXICO.

By GEORGE VASEY.

Paspalum paucispicatum sp. nov. Culms rooting at the lower nodes, ascending, about 2 feet high, nodes pubescent; leaves of culm 4 to 8 inches long, 3 to 5 lines wide, smooth; panicle of 2 to 3 approximate, erect, straight spikes, 3 to 3½ inches long; spikelets in 4 rows, elliptical-oblong, 1½ lines long, acute, the outer glume minutely puberulent, 3-nerved; inner empty glume glabrous; perfect flower whitish, longitudinally striate.

Collected at Guadalajara by Dr. Edward Palmer (No. 243) in 1886.

Paspalum inops sp. nov. Culms 9 to 12 inches high, slender; leaves 2 to 4 inches long, 2 to 4 lines wide, villose with scattered hairs, the upper very short or wanting the blade; sheaths villose; panicle consisting of about 2 spikes, approximate, about 1 inch long, the rachis narrow, spikelets in two rows, roundish-obovate, pale, smooth, or minutely pubescent, little more than 1 line long.

Collected at Guadalajara by Dr. Edward Palmer (No. 592) in 1886.

Paspalum culiacanum sp. nov. Apparently annual; culms erect, 1½ to 2 feet high, leafy, smooth, rather slender; leaves linear-lanceolate, 6 to 10 inches long, acuminate, 4 to 6 lines wide, smoothish or somewhat scabrous; lower sheaths open and free when mature, compressed; ligule fimbriate; spikes 3 to 5, rarely 2; 1½ to 2½ inches long, rather loosely flowered, spreading, arcuate, ½ to ¾ inch distant; rachis narrower than the spikelets, scabrous; spikelets in 2 series, mostly in pairs, occasionally with a small additional lower glume, about 1 line long, oblong, obtuse, smooth.

Collected by Dr. Edward Palmer in the mountains of Culiacan (No. 1647) in 1891. Has somewhat the appearance of *P. lavei*, but with shorter, more approximate spikes, and smaller spikelets.

Panicum (Ptychophyllum) palmeri sp. nov. Annual; culms robust, 4 to 6 feet high, leafy; leaves 1 to 1½ feet long, 1 to 1½ inches wide, acuminate, with about 15 principal nerves, scabrous on the margins; ligule short, incised; panicle racemose, 6 to 10 inches long, 2 to 3 inches wide, the simple erect branches scattered unequally and singly along the rachis, unequal, gradually diminishing from below to the apex, scabrous, the lower ones 2 to 4 inches long, flowering nearly or quite to the base or sometimes naked at the base; spikelets 2 lines long, conical, one-sided, sessile, crowded, with one bristle at the base of each; first glume ovate, one-fourth as long as the spikelet, 3-nerved; second glume nearly as long as the spikelet, 11- to 13-nerved; third or glume of the male floret the longest and as long as the spikelet; palea nearly as long, 5-nerved; perfect floret little more than 1 line long, elliptical, obtuse or subacute; bristles variable, the lower twice as long as the spikelet, the upper ones about equaling it.

Collected by Dr. Edward Palmer at Tequila in 1886. This is near *Setaria cirrhosa* Fourn., but differs in its very stout culm, and the length of the lower glume.

Aristida (Ortachne) manzanilloana sp. nov. Apparently annual; culms tufted, 2 to 2½ feet high, smooth, slender, erect, simple, or geniculate and branching below; leaves 2 to 3 inches long, plane below, conduplicate above, not rigid, very narrow, almost setaceous; sheaths shorter than the blade; panicle racemose, simple, 4 to 5 inches long; branches single, or 2 or 3 together, the lower about 1 inch long, sessile, with 3 to 5 somewhat crowded spikelets; empty glumes about 3 lines long, awn-pointed, nearly equal; floral glume with the undivided awn about 1 inch long when mature, scabrous on the keel, not twisted, flattish, commonly curved above.

Collected in the mountains about Manzanillo by Dr. Edward Palmer, December 1 to 31, 1891 (No. 1084). This species differs from *A. tenuis* variety *flexuosa* in its culms being slender and flexuous, leaves softer, and spikelets with a few scattered hairs.

Aristida appressa sp. nov. Culms 2 to 4 feet high, slender, smooth; lower leaves not seen, the upper ones narrowly setaceous, erect, 4 to 6 inches long; panicle 8 to 12 inches long, narrow; the branches alternate or in twos, appressed, the lower 3 to 4 inches long, naked below, above subdivided, with appressed spikelets; empty glumes equal or nearly equal, about 5 lines long, setaceous pointed, scabrous on the keel; floral glume 3 times longer, slender, purple, somewhat twisted below the awns, which are nearly equal, the lateral ones about 5 lines and the middle one about 6 lines long.

Collected at Guadalajara by Dr. Edward Palmer in 1885. Dr. Palmer states that the long slender culms are collected by the natives and tied together in bundles for brooms.

Variety brevior var. nov. Culms tufted and strongly rooted, 2 to 3 feet high, with 3 or 4 leaves, 6 to 10 inches long, flat, the upper becoming involute, sheaths glabrous; ligule obsolete; panicle 8 to 10 inches long, the branches appressed; spikelets nearly as in the preceding, but the floral glume little longer than the empty ones, the awns a little longer and nearly equal.

Collected at Rio Blanco by Dr. Edward Palmer (No. 516) in 1886.

Muhlenbergia flavida sp. nov. Annual; culms weak, decumbent, and much branched below, 12 to 15 inches long, the lateral branches sometimes one-half as long; leaves narrowly linear, 2 to 4 inches long; sheaths shorter than the internodes, smooth; ligule narrow, 1 to 2 lines long; panicle 5 to 6 inches long, lax and open; the branches scattered, mostly single, capillary, rarely subdivided, 1 to 1½ inches long, very slender and racemosely flowered above, naked below; spikelets on short pedicels, alternate, rather distant below, approximate above; empty glumes equal, ovate at base, tapering to an awn-like point, with the points reaching to the middle of the floral glume, which is elliptic-oblong, flattish, 1 line long, 3-nerved, minutely pubescent on the nerves, yellowish, with an awn about as long as its glume; palea as long as the glume, bifid at the apex.

Collected at Rio Blanco by Dr. Edward Palmer (No. 645) in 1886.

Muhlenbergia elata sp. nov. Culms densely tufted, strongly rooted, 4 to 6 feet high, smooth; radical leaves 1 to 2 feet long, flat and narrow below, setaceous-involute above; ligule about 3 lines long, pointed, decurrent; panicle 1 to 2 feet long, spreading, flexuous; the main axis scabrous, the branches scattered, erect-spreading, single or semiverticillate, capillary, 4 to 6 inches long, subdivided nearly to the base, the branchlets sparsely flowered; spikelets on long pedicels; empty glumes about 1 line long, narrow, nearly half as long as the spikelet, one or both short-awned; floral glumes linear, 1½ lines long, acuminate into a fine straight awn 3 to 4 lines long.

Collected near Guadalajara by Dr. Edward Palmer (No. 770) in 1886. Very tall, with a large, graceful, bending panicle, resembling *M. capillaris* Kth.

Muhlenbergia scoparia sp. nov. Culms densely tufted, 3 feet high, erect; leaves narrowly linear, 1 to 1½ feet long, conduplicate, rigid, smooth; panicle 1 to 1½ feet long, loose, flexuous, 1 to 2 inches wide, branches scattered, erect, single, or 2, 3, or 5 together, rather distant, 1 to 3 inches long, flowering nearly to the base, much subdivided above; spikelets on pedicels 1 to 3 times as long as themselves; empty glumes nearly equal, ovate-lanceolate, awn-pointed, the points extending beyond the floral glume, which is 1 line long, purple, smooth except a small hairy tuft at the base, and with an awn 8 to 10 lines long.

Collected at Batopilas by Dr. Edward Palmer in 1885, and at Guadalajara (No. 2350) by C. G. Pringle in 1889.

Muhlenbergia longiglumis sp. nov. Culms strongly tufted, 2 to 2½ feet high; radical leaves one-half as long as the culm, rigid, narrowly linear, channeled and more or less involute, scabrous; upper culm leaves very long, lower sheath compressed, smooth; ligule narrow, 3 to 4 lines long, fimbriate, decurrent; panicle 1 foot or more long, contracted, flexuous, rather thin, the branches slender, scattered, single or semiverticillate, approximate or somewhat interrupted below, unequal, the longer about 2 inches long, erect, narrow; spikelets on short pedicels; empty glumes 2½ lines long, whitish, membranaceous, minutely puberulent, acute or mucronulately toothed, a little longer than the floral glumes, which are linear-lanceolate, tapering to the 2-toothed apex, smooth or minutely puberulent, with a short, hairy tuft at the base; awn 1½ to 2 inches long; palea nearly equaling its glume.

Collected at Guadalajara by Dr. Edward Palmer (No. 766) in 1886, and by C. G. Pringle (No. 2365) in 1889.

Muhlenbergia longifolia sp. nov. Culms densely tufted, 4 feet high, stout; radical leaves almost equaling the culm, narrow at the base, rigidly involute above, margins scabrous, sheaths smooth; ligule conspicuous, 2 to 3 lines long, acute, rigid, decurrent; panicle 1½ to 2 feet long, 1½ to 2 inches wide, erect, not very dense, the branches scattered, the lower ones 3 to 5 inches long, loosely appressed, capillary, thinly flowered, more or less naked below; spikelets very slender, on long pedicels; empty glumes unequal, the lower less than, and the upper more than, one-half as long as the floral one, the upper awn-pointed; floral glumes linear, little more than 1 line long, attenuate into the 4-line long awn.

Collected at Rio Blanco by Dr. Edward Palmer (No. 523) in 1886.

Muhlenbergia grandis sp. nov. Culm strongly rooted, robust, 4 to 6 feet high, leafy, compressed below; leaves distichous at base, one-half to two-thirds as long as the culm, scabrous on the margins, ½ inch wide below, attenuate and often convolute above, rigid; lower sheaths compressed; ligule very short (1 or 2 lines), triangular; panicle 1 to 2 feet long, 2 inches wide, dense, the branches scattered or semiverticillate, 2 to 3 inches long, crowded, flowering mostly to or near the base, erect and appressed, pedicels mostly shorter than the spikelets, which are about 1 line long; empty glumes equaling the floral one, thin-membranaceous, oblong-lanceolate, acute or subacute; floral glume elliptical-oblong, smooth except a few hairs at the base; awns 8 to 10 lines long.

Collected at Rio Blanco by Dr. Edward Palmer (No. 515) in 1886; and by C. G. Pringle at Jalisco (No. 1760) in 1888. A tall and attractive grass, with a large contracted plume-like, dense panicle, with small spikelets. It differs in its greater size, longer and larger panicle, and its short ligule from the *M. distichophylla* Kth. of our Southern border.

Sporobolus capillaris sp. nov. Perennial, tufted, with a thick rhizome; culms about 2 feet high, slender, flexuous, smooth; radical leaves narrow, smooth, setaceous-pointed, 4 to 6 inches long; those of the culm (3 or 4) similar, erect, sheaths smooth; ligule minute; panicle 5 to 7 inches long, capillary, spreading, flexuous, the branches capillary, numerous, approximate, mostly scattered, sin-

gle, 1 to 2 inches long, much branched, sometimes from the base, sometimes above, the branchlets diverging; spikelets minute on long pedicels, about $\frac{1}{2}$ line long, purplish; empty glumes unequal, the upper one-half to two-thirds as long as the floral ones, the lower one-half to two-thirds as long as the upper, both obtuse; floral glume smooth, obtuse; palet equaling its glume.

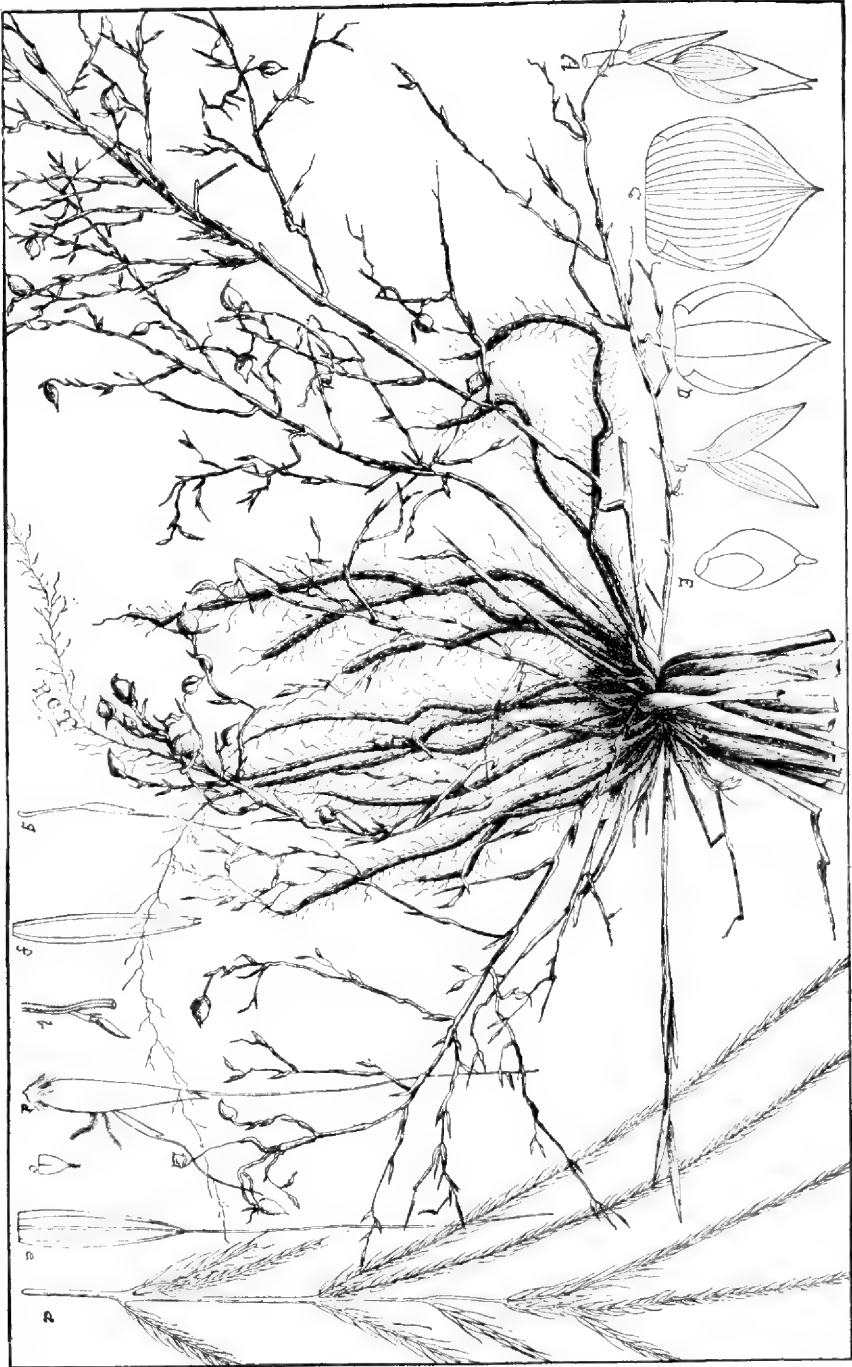
Collected at Rio Blanco by Dr. Edward Palmer in 1886 (No. 512); and by C. G. Pringle (No. 3853) near Guadalajara in 1891.

Chloris longifolia (Fourn.) Vasey. *Gymnopogon longifolius* Fourn. Mex. Pl. ii. 144 (1886). Culms $1\frac{1}{2}$ to 2 $\frac{1}{2}$ feet high, rather stout, leafy, caespitose, bearing at the base numerous branching seed-bearing stolon-like panicles sometimes 6 inches long; leaves 6 to 10 inches long, flat, 3 to 4 lines wide, scabrous on the margins and upper surface, longer than the internodes, the lower ligules ciliate to pilose; apical panicle 5 to 8 inches long, of 5 to 10 racemose spikes erect at first, then spreading, usually in threes below, the others irregularly scattered, narrow and spikelet-bearing to the base; spikelets somewhat imbricated above, becoming more distant, but approximate below, one-sided, with one perfect and one sterile floret; empty glumes unequal, the lower minute, subobtuse, the upper one less than 1 line long, ovate, acute or acuminate, purplish, scarious-margined; floral glume linear, $2\frac{1}{2}$ to 3 lines long, with a distinct hairy callus at the base, and finely scabrous on the midnerve near the apex, otherwise smooth, with two short teeth at the apex, and between the teeth a scabrous awn 3 to 4 lines long; palet as long as its glume, terminating in 2 slender acute teeth; imperfect floret pedicellate, $\frac{1}{2}$ to 1 line long, linear, with an awn about 2 lines long; grain linear-oblong, the hilum occupying one third its length. The panicles at the base of the culm are numerous, from 2 to 6 inches long, and irregularly branched. These seem to run on or near the surface of the ground, and here and there give rise to fertile florets, which are larger than those in the aerial panicle, and with a larger, rounder grain; the fertile florets about 3 lines long, oblong or oval, with an abrupt point; empty glumes nearly equal, ovate, about 2 lines long, many-nerved; floral glume oval, thickish, acute, nearly as long as its palet; grain oblong, abruptly pointed, about 2 lines long, much longer and heavier than the grains of the panicle, the hilum occupying one-half its length. I have not observed any stamens in the florets of the stolons.

Collected at Ymala, Sinaloa, by Dr. Edward Palmer, in September, 1891 (No. 1763). I have no doubt that this remarkable grass should be placed in the genus *Chloris*. It is unusual in the racemose disposition of its spikes, they commonly being verticillate or digitate at the summit of the peduncle, but in *Chloris verticillata* Nutt. there is a form with two or three verticillate somewhat distant whorls of spikes. Fournier, in his account of Mexican grasses, gives 6 species of *Chloris*, all different from this. He, however, gives two species of *Gymnopogon*, one of which from the description given may be our grass, inasmuch as he remarks that the empty glumes in the species he describes are smaller than in the type of the genus. I have not seen any specimens of the species he describes, but our plant is excluded from *Gymnopogon* by the spikes being regularly floriferous throughout, instead of being interruptedly floriferous, and also in the greater development of the second floret. There is no mention in any account of the species of *Chloris*, nor of the tribe *Chlorideae*, of the floriferous stolons at the base of the culm. The only analogous case that I know of is that of *Amphicarpum*, a grass of the pine barrens of New Jersey and extending to Florida, in which there are similar but less branching runners, bearing fertile florets, those of the upper panicle being all sterile, while our plant has perfect seeds on the upper panicle as well as on the lower panicles.

EXPLANATION OF PLATE XIX.—Base of plant, with creeping panicle of cleistogamous florets; A, bract and spikelet magnified three times; B, empty glumes; C, floral glume, ventral view; D, palet, ventral view; E, grain; a, panicle at the apex of the culm, slightly smaller than natural size; b, rachis, pedicel and empty glumes; c, second empty glume; d, florets, side view, magnified three times; e, floral glume, dorsal view; f, palet; g, imperfect floret.

CHLORIS LONGIFOLIA (Fourn.) Vasey.



Eragrostis pallida sp. nov. Apparently annual; culms erect, more or less branched at the base, $1\frac{1}{2}$ feet high, smooth; leaves 2 or 3 on the culm, 3 to 5 inches long, erect, acuminate; ligule inconspicuous, truncate; sheaths shorter than the internodes; panicle 6 to 9 inches long, $\frac{1}{4}$ to $\frac{1}{2}$ inch wide, pale, strict, sometimes interrupted below, crowded above; branches unequal, semiverticillate, numerous, the longer $1\frac{1}{2}$ inches long, strict, all closely flowered to the base; spikelets 1 line long, 5-flowered; empty glumes less than $\frac{1}{2}$ line long, 1-nerved, subacute; floral glumes $\frac{1}{2}$ line long, subacute, 3-nerved.

Collected in a ditch at Colima, January 9 to February 6, 1891 (No. 1268), by Dr. Edward Palmer. At first I thought this might be *E. alba* Presl., but it does not answer the description; neither does the Californian species, so called by Dr. Thurber, which is quite different from the present species.

Eragrostis diversiflora sp. nov. Culms densely tufted, 2 to 8 feet high, firm, leafy at the base, lower leaves 6 to 8 inches long, gradually narrowed to long, setaceous points; sheaths smooth; ligule ciliate with long hairs; upper leaves distant, filiform; panicle spike-like, interrupted below, 7 to 10 inches long, $\frac{1}{4}$ inch wide, the nearly sessile branches densely crowded, interrupted and distant below, also on the same plant some panicles open and thinly flowered; spikelets linear, 3 to 4 inches long, 7- to 13-flowered or on less perfect culms reduced to 5, 3, or 2; outer glumes ovate, subacute, similar in texture to the floral glumes, which are ovate-lanceolate, rather thick, subobtusate, smooth, the lateral nerves not prominent.

Collected at Manzanillo (No. 1335) by Dr. Edward Palmer, March 2 to 18, 1891. Here should be referred W. G. Wright's No. 1318, from Mazatlan, 1889.

DESCRIPTIONS OF FOUR NEW PLANTS FROM TEXAS AND COLORADO.

By J. M. HOLZINGER.

Claytonia bodini sp. nov. Canline leaves two, opposite, terete, fleshy; a lanceolate, leaf-like, recurved bract opposite the first pedicel of the raceme; raceme 5- to 10-flowered; lower pedicels much elongated, 1.3 cm. long; pedicels in fruit drooping; fruiting sepals 1.3 cm. long, much surpassing the capsule, narrowly acuminate, persistent, little spreading after anthesis; petals longer than the sepals, narrowed upward, but with rounded apex.

Collected at Hempstead, Texas, in 1892, by J. E. Bodin.

Near *C. virginica*. The corm was not sent with these plants.

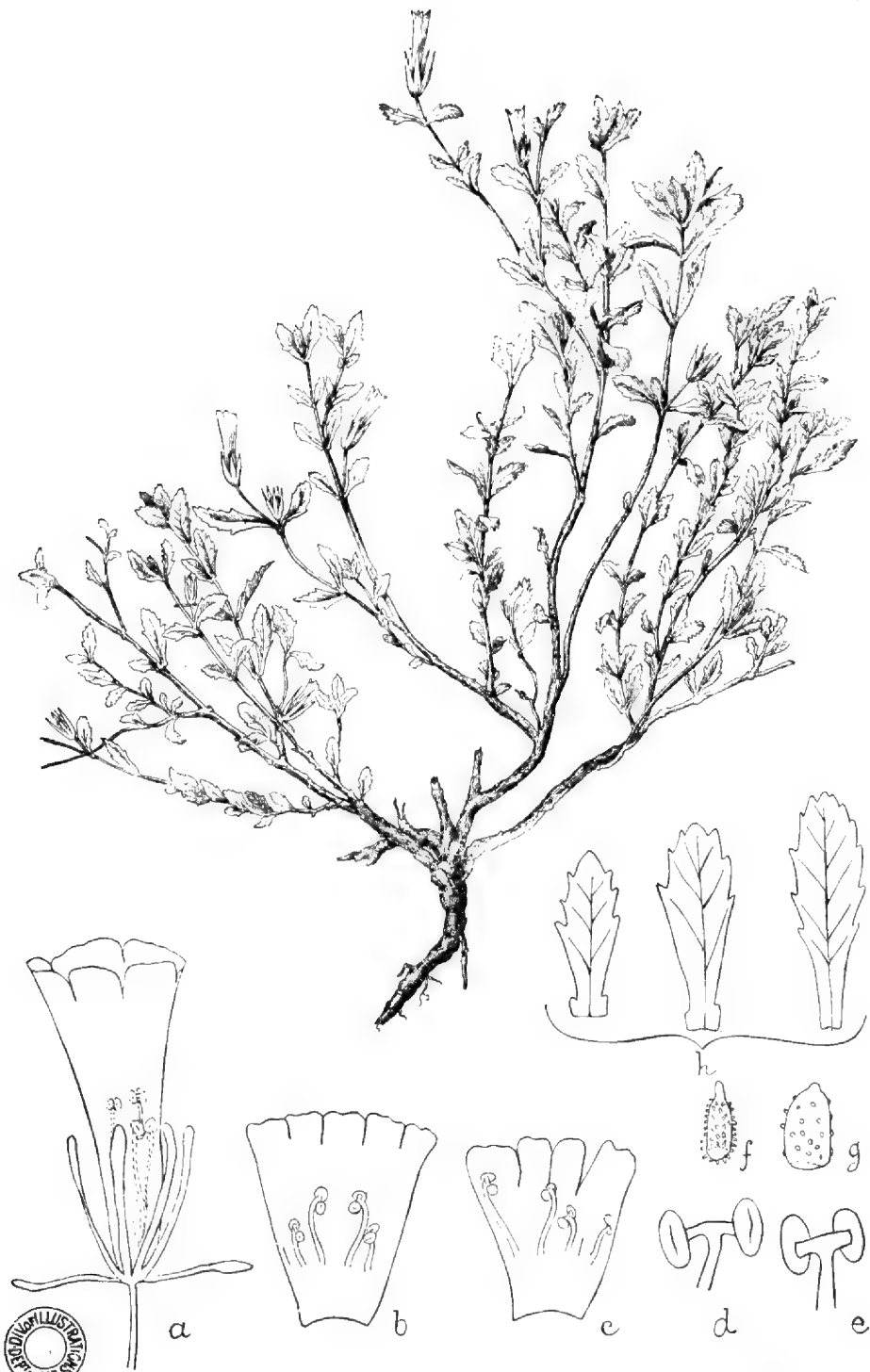
Baptisia lanceolata texana var. nov. Plant smaller than the type; leaflets wider and shorter, 1.6 cm. wide, 4 cm. long, or less; branches and internodes shorter; flowers 2 cm. long. In the typical form of the species the leaflets vary from 1.5 to 3 cm. in width, and from 6 to 10 cm. in length, and the flowers are 2.5 cm. or more long. The pubescence, including the ovary, the sessile leaves, and the nearly sessile solitary flowers in the axils of the upper leaves of the flowering branches, which are terminated by few-flowered racemes, associate this plant closely with *Baptisia lanceolata*.

Collected in Texas by G. C. Nealley in 1889 (No. 73).

Stemodia schottii sp. nov. A low and diffusely branched perennial herb, 10 to 15 cm. high, woody at the base; the entire plant, including branches, leaves, and outside of calyx and corolla, beset with minute, stipitate glands, probably making the plant viscid when fresh; internodes 1 to 2 cm. long; leaves sessile, wedge-shaped and slightly auricled at the base, but not connate, the margin above the entire basal part cut into a few coarse serratures, the apex obtuse; flowers single in the axils of the upper leaves; pedicels 3 to 5 mm. long, bibracteate under the flower; calyx lobes narrowly linear, about as long as the pedicel, a little longer than the similar bracts; corolla 12 to 14 mm. long, the tube dilated upward, blue at the limb, yellow on the under side and toward the base of the tube, the inside somewhat hairy, the large upper lobe outermost; stamens didynamous, the longer pair reaching the small notches in the limb; anther cells borne apart by a connective fully as long as the anther, becoming peltate after pollination; a rudiment of a fifth stamen present; ovary and style included; stigma single, somewhat dilated; capsule when ripe little shorter than the calyx lobes, splitting into four valves, leaving the pitted placenta in the axis; seeds small, oval, 0.3 mm. long, minutely hispid in lines.

Habitat, southern Texas, along the Rio Grande. Collected by Dr. A. Schott, at Rio Grande, Texas, in 1853; and by G. C. Nealley, at Comstock, Valverde County, Texas, in 1889 (No. 305). Dr. Schott's plant had been distributed as *Conoclea multifida*.

EXPLANATION OF PLATE XX.—Plant in flower; a, flower much enlarged, position of stamens indicated; b, corolla of *S. schottii*; c, corolla of *S. durantifolia*; d, e, connective and anther-cells; f, seed of *S. schottii*; g, seed of *S. durantifolia*; h, leaves of *S. schottii*.



STEMODIA SCHOTTII Holzinger

F. Muller



OXYBAPHUS BODINI Holzinger.

Oxybaphus bodini sp. nov. Plant 5 to 13 cm. high, diffusely spreading, the branches diverging nearly at right angles; stem whitish, as in some other species of this genus, glabrous to the naked eye, but under the lens minutely roughened by short hairs with points turned upward; internodes 1.3 cm. long or less; leaves long-linear, fleshy-leathery, drying as if terete, glabrous; flowers solitary in the axils of leaves toward the upper part of the stem, on pedicels much shorter than the involucre; these, with the involucre, covered with short, stiff, appressed hairs; involucre smaller, of firmer texture, and more deeply lobed than in *O. angustifolius* Sweet, which is suggested by the somewhat similar fruit as the nearest allied species. These characters, with the diminutive size, distinguish this plant.

Collected at Pueblo, Colorado, by J. E. Bodin (No. 236).

EXPLANATION OF PLATE XXI.—Plant, about natural size.

LIST OF PLANTS NEW TO FLORIDA.

By J. M. HOLZINGER.

Mr. J. H. Simpson was employed by the Department of Agriculture in 1891 and 1892 to collect plants in southern Florida. Among the many interesting species found by him are the following introductions and additions to our Southern flora:

- Achyranthes aspera obtusifolia** Lam. Strait of Florida, side of Key West, Simpson (No. 205).
- Alternanthera paronychioides** St. Hil. Key West, Simpson (No. 357).
- Argythamnia fendleri** Müll. Key West, Simpson (No. 316).
- Cassia grammica** Spreng. No Name Key, Simpson (No. 194).
- Colubrina reclinata** Brogn. Long Island, Simpson (No. 427); southern Florida, Curtiss (No. 473).
- Crescentia cucurbitina** L. Southern Florida, Simpson (No. 450). (Vide Gray, Syn. Fl. ii. pt. i. 456.)
- Cuscuta umbellata** H. B. K. Southern Florida, Simpson (No. 361).
- Epidendron rigidum** Sw. Florida, Curtiss (No. 1708). Communicated to the National Herbarium by Professor S. M. Tracy.
- Euphorbia pilulifera procumbens** Boiss. Elliott Key, Miami and Cedar Key, Simpson (No. 505); southern Florida, Garber; Indian River, Curtiss (No. 2496). Distributed as *E. pilulifera* L.
- Ipomoea tuba** Don. Key east of Bahia Honda, Simpson (No. 508).
- Melachra urens** Poir. Chokoliska Island, southern Florida, Simpson (No. 220).
- Phyllanthus niruri tenuicaulis** Muell. Cedar Key, Garber; No Name Key and Long Key, Simpson (Nos. 183, 309).
- Talinum patens** Willd. One plant was sent in by Mr. Simpson from southern Florida.
- Tamarindus indica** L. Key West, Simpson (No. 348). Mr. Simpson says of this: "It grows on dry, rocky hammock soil, mostly in the brush in uncleared land. Trees 20 to 30 feet high and from 12 to 18 inches or more in diameter. There were not many specimens, but enough to show that the species is naturalized at Key West, and should be admitted into our flora."
- Tillandsia polystachya** L. Chokoliska Island, Simpson (No. 289).
- Tridax procumbens** L. Elliott's Key, Simpson (No. 553).
- Villamilla octandra** (L.) Hook. f. Chokoliska Island (No. 238).



RANUNCULUS COOLEYÆ Vasey & Rose.

DESCRIPTIONS OF THREE NEW PLANTS.

By J. N. ROSE.

Ranunculus cooleyæ Vasey & Rose sp. nov. Glabrous, with a slender caudex bearing many long fibrous roots; scape, 1- or 2-flowered, naked or bearing a small leaf near the middle, in flower about the length of the leaves, in fruit 20 to 25 cm. high; radical leaves numerous, on petioles 3.6 to 10 cm. long, orbicular, 2.5 to 4 cm. in diameter, deeply 3-parted, each division again 3- to 5-parted; the lobes oblong, obtuse, granular-tipped; sepals 5, oblong, obtuse, deciduous, glabrous; petals 10, glabrous, yellow, oblong, obtuse, tapering at the base into a slender claw; stamens numerous; carpels very numerous, in a close head, strongly compressed laterally, 1- to 3-nerved on each side, glabrous, somewhat utricular; style short, reflexed; ovule 1, erect.

Collected in fruit by Miss Grace E. Cooley, near the top of a snow-covered ridge, among loose rock, near Juneau, Alaska, August 6, 1891, and collected in flower by Frederick Funston, near the top of a bare mountain (1,000 meters high) of the St. Elias Alps, above Disenchantment Bay, Alaska, August 10, 1892. Mr. Funston says the plant is very rare, and he was able to obtain only five specimens. There is some doubt as to what section of the genus it belongs to, but probably it should be referred to the *Crymodes* near *R. glacialis*. It resembles very much *R. hystericulus* of central California, especially in the outline of its leaves and carpels, but differs particularly in the lobing of the leaves and the smoothness of the carpels. This new species is named in honor of Miss Grace E. Cooley, instructor in botany at Wellesley College, who collected the plant on an excursion to Alaska.

EXPLANATION OF PLATE XXII.—1, fruiting specimen collected by Miss Cooley; 2, flowering specimen collected by Mr. Funston, both natural size; a, carpel; b, section of the same, showing the seed and its attachment; c, sepal; d, petal; e, lobe of a leaf from 2. Figures a and b are enlarged 7 diameters, c and d 3 diameters, and e 2 diameters.

Sphæralcea orcuttii Rose sp. nov. Perennial(?), 60 to 90 cm. high, with dense, stellate pubescence throughout; leaves thickish, ovate, entire or somewhat 3-lobed, with slightly cordate or truncate base, obtuse; flowers small, in close, glomerate clusters, on short or long racemes; calyx 4 mm. long, with ovate lobes; petals 8 mm. long, brick-red; styles clavate, thickened; carpels 12, reniform, strongly reticulated except the minute terminal portion, 2 mm. in diameter, 1-seeded.

Collected near Canso Creek, in the Colorado Desert, California, November 1, 1890, by C. R. Orcutt (No. 2210). This species, although referred to *Sphæralcea*, can hardly be kept out of *Malveopsis*. The carpel is more like that of the latter genus than of any other known species, and yet very similar to those of *S. coulteri* and *S. californica*.

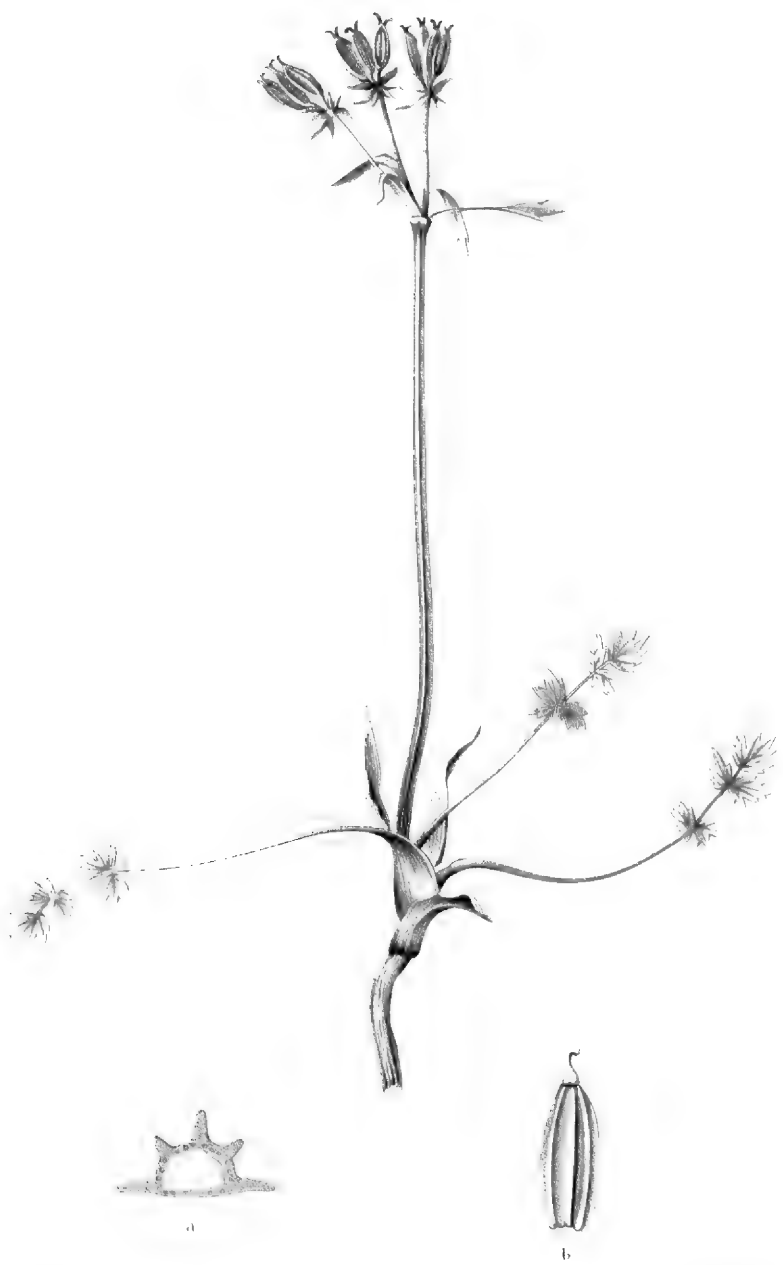
Ligusticum macounii Coult. & Rose sp. nov. Plant low, acanulescent, 10 to 12.5 cm. high, glabrous; leaves pinnate, small, 12 to 20 mm. long, on petioles 12 to 30 mm. long; pinnae 5, oblong or oval, 3- to 5-lobed or cleft; involucre few-

leaved; involucels small, entire; rays about 4, nearly equal, 12 to 18 mm. long; pedicels of fruit about 2 mm. long; carpels a little compressed dorsally; ribs prominent, nearly equal; oil tubes 2 or 3 in the intervals, 2 to 4 on the commissural side; fruit broadly ovate, 4 mm. long, purplish; seed face plane.

Common at Cape Vancouver, Alaska, but not seen elsewhere. Collected by J. M. Macoun, September 8, 1890, for whom it is named. In its low habit it is very different from all other North American species.

EXPLANATION OF PLATE XXIII.—Plant natural size; *a*, cross section of carpel, enlarged 6 diameters; *b*, carpel as seen from dorsal side, enlarged 3 diameters.

i



LIGUSTICUM MACOUNII Coulter & Rose.

W. C. C. & R.
Bot. of Calif. Acad. Sci.

LIST OF LICHENS FROM CALIFORNIA AND MEXICO, COLLECTED BY DR.
EDWARD PALMER FROM 1888 TO 1892.

By J. W. ECKFELDT.

- Roccella tinctoria** DC. San Diego, California, September to December, 1888 (Nos. 203, 268a, 276d, 280, 284, 297). On low bushes where the ocean fogs had full effect.
- Roccella leucophæa** Tuckerm. Coronados Islands, August 18, 1888 (Nos. 260c, 261a); Gaudalupe Island, March 29 and 30, 1889 (No. 905c). Abundant on low bushes, and covering the face of exposed rocks. Growing so luxuriantly as to be readily mistaken for ordinary vegetation.
- Roccella phycopsis** Ach. On the west side of False Bay, 14 kilometers west of San Diego, California, September 1888 (Nos. 277d, 277g). Growing on low bushes, just above the ocean beach, in full influence of salt water.
- Roccella fuciformis** (L.) Ach. La Paz, Lower California, January and February, 1890 (No. 261e); Agiabampo, Mexico, October, 1890 (No. 792e). Growing on the ground, and on low bushes; exposed to the fog and to the effect of salt water.
- Ramalina ceruchis** (Ach.) De Not. Coronados Islands, August, 1888 (No. 260a); San Diego, California, and vicinity, December, 1888 (Nos. 1, 204, 268b, 276c, 277b, 277e, 278, 287, 293, 298). Growing on low bushes and on the face of rocks in such abundance that the rocks are hidden.
- Ramalina homalea** Ach. On the coast south and west of San Diego, California, August to December, 1888 (Nos. 260d, 275e, 292, 299, 310); south end of Gaudalupe Island, March 29 and 30, 1889 (Nos. 905a, 905b).
- Ramalina reticulata** (Noehd.) Krempelh. San Diego, California, 1888 (Nos. 201, 209).
- Ramalina linearis** L. East side of False Bay, 11 kilometers southwest of San Diego, California, September, 1888 (No. 276g). On bushes, in a deep ravine where the ocean fogs had full effect.
- Ramalina menziesii** Tuckerm. San Diego, California, and vicinity (Nos. 211, 277a, 277h); Sweetwater Junction, 10 kilometers east of San Diego, California December, 1888 (No. 288); Agiabampo, Mexico, October, 1890 (No. 792 a).
- Ramalina complanata** (Sw.) Ach. La Paz, Lower California, January and February, 1890 (No. 85); San Diego, California, 1888 (No. 205); near Roseville, 3 or 4 kilometers west of San Diego, California, 1888 (No. 269f). On dead bushes, not far from the ocean.
- Ramalina calicaris** (L.) Fr. San Diego, California, 1888 (No. 294), and Mexico (No. 334f).
- Ramalina calicaris canaliculata** Fr. San Diego, California, December, 1888 (No. 293x).
- Ramalina calicaris fraxinea** Fr. Agiabampo, Mexico, October, 1890 (No. 792f).

- Ramalina calicaria farinacea** Schaer. No. 288 is a very broad state, quite unlike the narrower plant of the Eastern States. Vicinity of San Diego, California, December, 1888 (Nos. 283, 288).
- Ramalina pollinaria** Ach. San Diego, California, and vicinity, 1888 (Nos. 276a, 276b, 281).
- Ramalina crinita** Tuckerm. On bushes 5 to 10 cm. high. Harbor of San Diego, California, September, 1888 (No. 268c).
- Cetraria saepincola chlorophylla** Wahl. A well marked but pale form. Harbor of San Diego, California, December 16, 1888 (No. 286).
- Usnea barbata florida** Fr. Mexico, 1890 (?) (No. 334a).
- Usnea barbata rubiginea** Mx. San Diego, California, and vicinity, September to December, 1888 (Nos. 202, 276a, 282, 296).
- Usnea longissima** Ach. Hanging in long, slender clusters from trees. Used by the natives as medicine for the blood. Purchased in the market at Colima, Mexico, January and February, 1891 (No. 1403).
- Alectoria canariensis** (Ach.) Mont. San Diego, California, 1888 (No. 208).
- Schizopelte californica** Th. Fr. A rare species. Growing in great confusion on the face of exposed rocks on the northeast coast of the largest of the Coronados Islands, 32 kilometers south of San Diego, California, August 18, 1888 (No. 260b).
- Theloschistes flavicans** (Sw.) DC. San Diego, California, 1888 (No. 200).
- Theloschistes parietinus** (L.) Norm. San Diego, California, 1888 (Nos. 289, 295).
- Theloschistes polycarpus** Ehrh. Near Roseville, 3 or 4 kilometers west of San Diego, California, 1888 (No. 269a); Guadalupe Islands, under overhanging rocks, March, 1889 (No. 904).
- Theloschistes ramulosus** Tuckerm. Harbor of San Diego, California, September, 1888 (No. 268d).
- Parmelia perforata** (Jacq.) Ach. Mexico.
- Parmelia perforata** (Jacq.) Ach. Forma hypotropa Nyl. In a deep ravine in the vicinity of San Diego, California, September, 1888 (Nos. 276f, 279).
- Parmelia camtschadalis** (Ach.) Eschw. Mexico (?).
- Parmelia caperata** (L.) Ach. Mexico (?).
- Parmelia conspersa** (Ehrh.) Ach. On rocks and earthbanks, 11 kilometers south-west of San Diego, California, September, 1888 (Nos. 275c, 291).
- Physcia leucomela** (L.) Mx. Tepic, Mexico, January 10, 1892.
- Physcia hispida** (Schreb. Fr.) Tuck. On dead and decaying plants of *Euphorbia misera*, Roseville, California, September, 1888 (No. 270a); on low bushes at False Bay, California, September, 1888 (No. 276i); Harbor of San Diego, California, December, 1888 (Nos. 285, 206, 212).
- Lecanora pallida cancriformis** Tuck. Mexico, July 12, 1890 (No. 1989b).
- Lecanora cenisia** Ach. Harbor of San Diego, California, December 6, 1888 (No. 275x).
- Pertusaria flavicunda** Tuckerm. Point Como light-house, California, December 15, 1888 (No. 290).
- Pertusaria wulfenii** DC. South end of Guadalupe Island, March 29 and 30, 1889 (No. 903).
- Urceolaria scruposa** (L.) Nyl. Harbor of San Diego, California, December 6, 1888 (No. 275b).
- Cladonia pyxidata** (L.) Fr. East side of False Bay, near San Diego, California, September, 1888 (No. 275d).
- Cladonia fimbriata** (L.) Fr. California (No. 19c).
- Cladonia rangiferina** (L.) Hoffm. Mexico.
- Buellia oidalea** Tuckerm. One specimen (No. 213) well represents the muriform type of the spore, which is characteristic of the species. San Diego, California, 1888 (Nos. 213, 276b, 277f).

REPORT ON A COLLECTION OF PLANTS MADE IN THE STATES OF SONORA AND COLIMA, MEXICO, BY DR. EDWARD PALMER, IN THE YEARS 1890 AND 1891.

By J. N. ROSE.

The collection here reported upon was made by Dr. Edward Palmer, chiefly in the States of Sonora and Colima during the latter part of 1890 and the early months of 1891. The localities visited were Agiabampo, Manzanillo, Colima, and Armeria.

Dr. Palmer arrived at Agiabampo September 12, en route for Alamos. Heavy showers had previously fallen and vegetation was well advanced, but few plants were as yet in flower. From this place he went directly to Alamos and obtained a valuable collection, upon which a report has already been made.* While at Alamos one of those dry, hot winds, so characteristic of this region, occurred and seriously injured or killed many of the plants; heavy showers fell again on October 1, reviving some plants which were in unexposed places. Dr. Palmer returned to Agiabampo October 3, and was much disappointed at finding the vegetation in so poor a condition. Collecting was difficult and unsatisfactory, but his work under these circumstances was most admirably done, as shown by the many new and interesting plants enumerated in this report. About 55 species were obtained. The specimens are numbered from 752 to 815, the result of two weeks' collecting at this place.

The town of Agiabampo is a small seaport on the Gulf of California, in the extreme southern part of Sonora. It is 145 miles southeast of Guaymas and about 60 miles from Alamos, the latter of which is almost wholly dependent upon Agiabampo for supplies. After finishing the work at Agiabampo, Dr. Palmer visited Carmen Island and returned to Guaymas, where the trip to the State of Colima was planned.

Manzanillo was reached by steamer December 1. This village is a small one, containing only about 500 inhabitants, has an excellent harbor, and is situated at the foot of a low range of mountains. It is the seaport of Colima and is connected with that city by railway. Dr. Palmer spent the month of December, 1890, about Manzanillo, collecting chiefly in the mountains and in the low, marshy places about the bay.

* See this volume, pp. 91 to 116.

He stopped here two weeks in the following year (March 2 to 16, 1891), securing many plants not obtainable earlier in the season.

From Manzanillo he went to Colima, the capital of the state of the same name. Almost a month was spent here (January 9 to February 6, 1891), and a second visit was made later, February 27 and 28. One day (February 15) was spent in Armeria, a small place half way between Manzanillo and the city of Colima.

The following table will show the places visited, with the dates of collection and the numbers of the plants:

Places visited.	Date of collection.	Collector's numbers (inclusive).
Agiabampo	Oct. 3 to 15, 1890.	752-815
Manzanillo	Dec. 1 to 31, 1890.	816-1096
Colima	Jan. 9 to Feb. 6, 1891.	1097-1273
Armeria	Feb. 15, 1891.	1274-1293
Colima	Feb. 27 and 28, 1891.	1294-1328
Manzanillo	Mar. 2 to 18.	1329-1401
Colima (bought at market)	Jan. 9 to Feb. 6, 1891.	1402-1416*
Manzanill	Dec. 31, 1891.	1810-1812

The following interesting account of Colima and Manzanillo is taken from the consular report for January, 1885, by Emil Mahlo, U. S. consul at Manzanillo:

The state of Colima lies between $18^{\circ} 30'$ and $19^{\circ} 28'$ north latitude, and 105° to 107° west longitude; is bounded north by the state of Jalisco, east by the same state and Michoacan, and south and southwest by the Pacific Ocean. It covers, probably, an area of 4,000 square miles and is said to have between 70,000 and 75,000 inhabitants. All these figures are approximations, as no survey of the state has ever been made, nor have they had an official census since 1871. The city of Colima may have 30,000 inhabitants.

The topographical and geological features of the state are interesting. The ground rises gradually from the coast, frequently intersected by detached, unconnected ranges of the Cordilleras (Sierra Madre), forming between them terrace-like, fertile plains which make Colima one of the richest agricultural states of Mexico.

The city of Colima, in an altitude of 1,450 feet, and 58 miles distant from its port of Manzanillo, is situated almost in the center of one of the plains, which is probably 75 miles in circumference, traversed by several rivers and creeks.

Southeast and west of it are wooded mountains from 2,000 to 4,000 feet high, while to the north the ground again at first rises gradually, when suddenly, proud and majestic, the double volcano of Colima, about 20 miles distant, pushes itself high up above the surrounding country into the limits of eternal snow.

From here radiate the almost impassable deep "barrancas" which traverse the state in its northern and northeastern portion, making the communication with the interior of the Republic exceedingly difficult.

The base of the geological formation is granite; it is in many places overlaid by feldspathic porphyry, conjointly with limestone, gypsum, and shale. In and near the barrancas porphyry, trachite, and calcareous conglomerate predominate. The structure of the volcano of Colima is trachite.

Although entirely within the hot zone, this consular district can truly be said to present all kinds of climates. From the snow of the volcano and the cold climate of

*The numbers between 1410 and 1810 represent Dr. Palmer's collection in the state of Sinaloa, made in 1891. The identification of these plants is nearly completed and will form the basis of a future paper.

the high surrounding country through the temperate, beautiful climate of the terraced slopes and plateaus, down through the semitropical to the tropical heat of the shores of the Pacific, are represented the three principal climatic zones.

To this difference in the climate is due the great variety of the agricultural products grown in this district. There are only two marked seasons—the rainy and the dry season. The rains commence invariably at the end of May or the beginning of June and terminate about the end of October.

I give herewith in a tabular form a résumé of the annual rainfall as observed by an intelligent private citizen of Colima during the years 1869 to 1880, inclusive. This is, as far as I know, the first reliable compilation of meteorological observations ever made on this coast of Mexico. The place of observation is the city of Colima.

Years.	Mean annual rainfall.		Years.	Mean annual rainfall.	
	Inches.	Number of days of rain.		Inches.	Number of days of rain.
1869.....	60.2	91	1875.....	39.1	82
1870.....	47.6	97	1876.....	35.1	89
1871.....	35.1	53	1877.....	32.2	72
1872.....	64.8	71	1878.....	60.1	79
1873.....	64.7	76	1879.....	45.0	88
1874.....	48.0	75	1880.....	41.0	75

Yearly mean for twelve years, 46 inches; yearly average number of rainy days, 79.

It is to be regretted that no hygrometric observations have been made. The atmosphere contains considerable humidity the whole year round.

The maximum temperature in the shade, as observed, was, in July, 96° F.; the minimum in February, 70° F.; greatest variation during the year, 26°; annual mean, 83°.

The observed monthly mean temperature during one year (1880) gave the following result:

Month.	Mean.	Month.	Mean.
	Degrees F.		Degrees F.
January.....	75	July.....	86
February.....	71	August.....	83
March.....	78	September.....	79
April.....	81	October.....	78
May.....	83	November.....	78
June.....	83	December.....	77

On the higher plateau in the interior the thermometer ranges from 54° to 90°.

While the climate of the port of Manzanillo is not very healthy, the city of Colima, at an elevation of 1,450 feet, and other places farther inland and of a higher altitude, are considered healthy places.

The state of Colima, small though it is, is one of the most fertile of Mexico, and is noted for the variety of agricultural products. It produces maize, rice, coffee, sugar, cotton, cocoa, indigo, tobacco, the castor-oil bean, etc.; and upon the higher plateaus of Jalisco and Michoacan wheat, maize, and potatoes are cultivated.

Of all the tropical and semitropical fruits which this part of Mexico produces I will mention only the following: Cocoa, limes, oranges, mangoes, bananas, pineapples, tamarinds, the chico (a very delicious fruit), the "aguacate," and the mamey. Limes are exported from Manzanillo to San Francisco to a considerably extent; also some pineapples, oranges, and mangoes.

In the small state of Colima alone over two hundred different kinds of useful and valuable woods are encountered; fine cabinet and dyewoods and woods for construction. The most valuable of these, as, for instance, mahogany, cedar, "primavera," granadillo, "tampinziran" palo-maria, palo-fierro, are articles of export to Europe and to the United States. They grow in abundance all along the coast and to a considerable distance inland. Among the dyewoods are the "campeachy," and palo Brazil. On the higher plateau fine oak and pine forests are met with. Fibrous plants and trees also grow in abundance. Besides the majestic "palma de coco" we have the useful palm-nut oil tree (palma de coquito de aceite) and other species of palms.

The rubber tree grows wild in the forests of the lowland along the Pacific coast. Some crude rubber is made, chiefly by the natives, and is exported to Europe and to the United States.

I am under obligation to many botanists who have aided me in comparing my specimens with those owned or controlled by them.

Dr. George Vasey, late chief of the division of botany, gave me every facility to carry on this work, and is wholly responsible for the determination of the grasses. The following list comprises the grasses determined by him:

<i>Egopogon gracilis.</i>	<i>Hilaria cenchroides.</i>
<i>Antheophora elegans.</i>	<i>Jourea straminea.</i>
<i>Aristida manzanilloana.</i>	<i>Muhlenbergia exilis.</i>
<i>Aristida tenuis.</i>	<i>Opismenus humboldtianus nudicaulis.</i>
<i>Arundinella brasiliensis.</i>	<i>Opismenus setarius.</i>
<i>Bouteloua bromoides.</i>	<i>Panicum molle.</i>
<i>Bouteloua polystachys.</i>	<i>Panicum capillaceum.</i>
<i>Cathestecum erectum.</i>	<i>Panicum divaricatum.</i>
<i>Cenchrus echinatus.</i>	<i>Panicum myurum.</i>
<i>Chloris radiata.</i>	<i>Panicum pringlei.</i>
<i>Elesine indica.</i>	<i>Panicum sanguinale ciliare.</i>
<i>Eragrostis ciliaris.</i>	<i>Panicum trichanthum.</i>
<i>Eragrostis plumosa.</i>	<i>Paspalum conjugatum.</i>
<i>Eragrostis diversiflora.</i>	<i>Paspalum paniculatum.</i>
<i>Eragrostis pallida.</i>	<i>Pennisetum setosum.</i>
<i>Eragrostis purshii.</i>	<i>Phragmites communis.</i>
<i>Gouinia polygama.</i>	<i>Sporobolus argutus.</i>

Prof. Daniel C. Eaton has named the ferns and fern allies of which the following species were obtained:

<i>Adiantum concinnum.</i>	<i>Pellaea rigida.</i>
<i>Aspidium patens.</i>	<i>Phegopteris tetragona.</i>
<i>Aspidium trifoliatum.</i>	<i>Polypodium elongatum.</i>
<i>Gymnogramme calomelanos.</i>	<i>Polypodium incanum.</i>
<i>Lygodium mexicanum.</i>	<i>Polypodium lanceolatum.</i>
<i>Notholena brachypus.</i>	<i>Selaginella lepidophylla.</i>

The following Cyperaceæ were determined by Dr. N. L. Britton:

<i>Cyperus canus.</i>	<i>Cyperus ottonis.</i>
<i>Cyperus compressus.</i>	<i>Cyperus regiomontanus.</i>
<i>Cyperus fugax.</i>	<i>Eleocharis geniculata.</i>
<i>Cyperus ligularis.</i>	

The late Dr. Sereno Watson, to whose kindness I have repeatedly referred in the past, assisted me in various ways in the preparation of this report. One of his last letters contained a note on *Pisonia aculeata*,

which appears in its proper place in the text. To him were submitted the following species:

<i>Eupatorium dissectum.</i>	<i>Forkhammeria pallida.</i>
<i>Fleischmannia rhodostylis.</i>	<i>Heteropterys palmeri.</i>
<i>Forkhammeria watsoni.</i>	

Dr. B. L. Robinson, the present curator of the Harvard Herbarium, has again and again loaned specimens for comparison and study. He has also aided me in the study of *Ayenia manzanilloana* and *Cratæra palmeri*. Specimens of nearly all the new species have been submitted to him.

Dr. Casimir DeCandolle, of Geneva, has determined all the plants of the genus *Piper*, including one new species and two varieties, as well as two new species of the genus *Trichilia*. The following are the species examined by him:

<i>Piper palmeri.</i>	<i>Piper umbellatum.</i>
<i>Piper palmeri manzanilloanum.</i>	<i>Piper unguiculatum longifolium.</i>
<i>Piper realejoanum.</i>	<i>Trichilia palmeri.</i>
<i>Piper tuberculatum.</i>	<i>Trichilia colimana.</i>

I also submitted to him for examination a new species and variety of my own, *Guarea palmeri* and *Trichilia harauensis spatulata*.

Mr. J. G. Baker, curator of the Herbarium at Kew, in addition to suggesting the relationship of the *Agave*, identified for me *Tillandsia polystachya* and *T. recurvata*.

Mr. W. Botting Hemsley, also of the Kew Gardens, has been especially helpful in definitely ascertaining that many of my new species were clearly distinct from closely related ones, specimens of which are to be found in several cases only at Kew. The following species were submitted to him for determination or comparison:

<i>Bumelia arborescens.</i>	<i>Ipomœa nelsoni.</i>
<i>Colubrina arborea.</i>	<i>Karwinskia parvifolia.</i>
<i>Heteropterys gayana.</i>	<i>Zizyphus mexicana.</i>

The following *Sapindaceæ* have been determined by Prof. L. Radlkofer, of Munich. Of the seven species determined four are new:

<i>Paullinia fuscescens.</i>	<i>Serjania rutæfolia.</i>
<i>Paullinia sessiliflora.</i>	<i>Serjania trifoliolata.</i>
<i>Paullinia tomentosa.</i>	<i>Serjania triquetra.</i>
<i>Serjania fuscopunctata.</i>	

Several other species were determined by Prof. Radlkofer, and proper credit is given in the text.

Mr. E. G. Baker, of the British Museum, has named most of the *Malvaceæ*, as well as aided me in the identification of the others. The following are those determined by him:

<i>Abutilon bastardioides.</i>	<i>Kosteletzkya asterocarpa.</i>
<i>Abutilon incanum.</i>	<i>Sida acuta carpinifolia.</i>
<i>Abutilon triquetrum.</i>	<i>Sida glutinosa.</i>
<i>Anoda hastata.</i>	<i>Sida ulmifolia.</i>
<i>Hibiscus sabdariffa.</i>	<i>Sida urens.</i>
<i>Malvariscus arboreus.</i>	

The following species have been determined by Prof. A. Cogniaux:

<i>Corallocarpus emetocatharticus.</i>	<i>Luffa operculata intermedia.</i>
<i>Curcubita radicans.</i>	<i>Sicyos sertuliferus.</i>
<i>Cyclanthera gracillima.</i>	<i>Tibouchina schiedeana.</i>

I have also received advice and assistance from the following well-known specialists: Dr. F. Pax, of Berlin; Mr. R. A. Rolfe, of Kew; Dr. K. Schumann, of Berlin; Dr. O. Hoffman, of Berlin; Dr. Hans Schinz, of Zurich; and Dr. A. Engler, of Berlin.

Mr. William M. Canby, Capt. John Donnell Smith, and Mrs. Katharine Brandegee have repeatedly loaned me specimens and aided me in many ways.

The following plants have been cultivated by Mrs. H. L. T. Wolcott at Halifax, Mass., during the summer and fall of 1892 from seeds obtained by Dr. Palmer:

<i>Agave angustissima.</i>	<i>Ipomœa quinquefolia.</i>
<i>Asclepias curassavica.</i>	<i>Ipomœa umbellata.</i>
<i>Henrya scorpioides.</i>	<i>Jussiaea octonervia.</i>
<i>Hibiscus sabdariffa.</i>	<i>Manihot angustiloba.</i>
<i>Ipomœa bracteata.</i>	<i>Nicotiana trigonophylla.</i>
<i>Ipomœa grayi.</i>	<i>Portulaca stelliformis.</i>
<i>Ipomœa nelsoni.</i>	<i>Theretia cuneifolia.</i>
<i>Ipomœa peduncularis.</i>	

It is proper to state here that this work of Mrs. Wolcott has been of great assistance to me in supplementing the herbarium specimens with fresh flowers, fruits, etc. She has entered into this work with enthusiasm and has looked after the plants almost continually, subjecting herself to no little outlay of time and money.

The following list comprises the new species described from this collection, of which 9 are from Agiabampo, 29 from Manzanillo, 26 from Colima, 4 from Armeria, and 2 from Sonora:

<i>Abutilon bastardioides.</i>	<i>Epidendrum palmeri.</i>
<i>Acalypha coryloides.</i>	<i>Eragrostis diversiflora.</i>
<i>Acalypha papillosa.</i>	<i>Eragrostis pallida.</i>
<i>Agiabampoia congesta.</i>	<i>Euphorbia colimæ.</i>
<i>Argithamnia manzanilloana.</i>	<i>Euphorbia sonore.</i>
<i>Aristida manzanilloana.</i>	<i>Flaveria robusta.</i>
<i>Ayenia manzanilloana.</i>	<i>Forchhammeria watsoni.</i>
<i>Brickellia colimæ.</i>	<i>Gaya minutiflora.</i>
<i>Bumelia arborescens.</i>	<i>Guarea palmeri.</i>
<i>Canavalia acuminata.</i>	<i>Heteropterys palmeri.</i>
<i>Capparis palmeri.</i>	<i>Hiræa mexicana.</i>
<i>Cassia manzanilloana.</i>	<i>Ipomœa nelsoni.</i>
<i>Ceiba grandiflora.</i>	<i>Ipomœa wolcottiana.</i>
<i>Celosia monosperma.</i>	<i>Jacobinia auriculata.</i>
<i>Cienfuegosia palmeri.</i>	<i>Jatropha purpurea.</i>
<i>Cratæra palmeri.</i>	<i>Justicia mexicana.</i>
<i>Drymaria procumbens.</i>	<i>Justicia paniculata.</i>
<i>Encelia purpurea.</i>	

Karwinskia parvifolia.
Krameria palmeri.
Leucana macrocarpa.
Lonchocarpus palmeri.
Luffa operculata intermedia.
Malpighia ovata.
Malpighia umbellata.
Mimosa manzanilloana.
Mimosa leptocarpa.
Panicum pringlei.
Paullinia sessiliflora.
Piper palmeri.
Piper palmeri manzanilloanum.
Piper unguiculatum longifolium.
Piptadenia leptocarpa.
Porophyllum palmeri.
Sassafridium macrophyllum.
Schrankia diffusa.

Serjania fuscopunctata.
Serjania rutafolia.
Serjania trifoliolata.
Spigelia palmeri.
Tabebuia donnell-smithii.
Tephrosia multifolia.
Tetramerium aureum.
Tetramerium diffusum.
Tetramerium tenuissimum.
Trichilia colimana.
Trichilia havanensis spatulata.
Trichilia palmeri.
Tridax dubia.
Figuiera tenuis alba.
Xylosma horrida.
Xylosma palmeri.
Zizyphus mexicana.

In addition to the foregoing new species, the following list comprises those plants not reported from Mexico by Mr. Hemsley in *Biologia Centrali-Americana*, most of them, however, having been described since that excellent work was published. The number of these species is 59.

Acacia cockliacantha H. & B.
Acalypha subviscida Watson.
Acnida cannabina L.
Ægopogon gracilis Vasey.
Æschynomene amorphoides Rose.
Æschynomene petraea Robinson.
Antigonon flavescens Watson.
Bigelovia diffusa Gray.
Bouchea dissecta Watson.
Bursera laxiflora Watson.
Bursera palmeri Watson.
Cacalia pringlei Watson.
Carlowrightia arizonica Gray.
Cereus strictus Brandegee.
Colubrina arborea Brandegee.
Comocladia dentata Jacq.
Corallocarpus emetocatharticus Cogn.
Corchorus acutangulus L.
Coursetia glandulosa Gray.
Coursetia mollis Rob. & Greenow.
Cyperus ottonis Boeckl.
Cyperus regiomontanus Britton.
Diphysa racemosa Rose.
Dracoecephalum moldavica L.
Euphorbia californica Benth.
Ficus fasciculata Watson.
Gomphrena decipiens Watson.

Gynandropsis pentaphylla DC.
Hamelia versicolor Gray.
Hibiscus sabdariffa L.
Hilaria cenchroides texana Vasey.
Jussiaea octoneuria Lam.
Malvastrum scabrum Gray.
Matayba scrobiculata Radlk.
Monniera trifolia L.
Oxalis berlandieri Torr.
Panicum capillaceum Lam.
Panicum sanguinale ciliare Vasey.
Paullinia tomentosa Jacq.
Pectis palmeri Watson.
Sapindus saponaria Radlk.
Selaginella lepidophylla Spring.
Sicyos sertuliferus Cogn.
Sida pyramidata Cav.
Solanum grayi Rose.
Solanum tequilense Gray.
Sporobolus argutus Kunth.
Stemodia palmeri Gray.
Tibouchina schiedeana Cogn.
Tournefortia floribunda H. B. K.
Veatchia discolor Brandg.
Verbesina sphærocephala Gray.
Zexmenia tequilana Gray.
Zinnia palmeri Gray.

The following species are included by Mr. Hemsley in *Biologia Centrali-Americana*, but not under the names here used:

Abutilon texense T. & G. = *Abutilon incanum* Don.
Prosopis heterophylla Benth. = *Acacia willardiana* Rose.
Acalypha chamaedrifolia Mull. = *Acalypha microphylla* Klotzsch.
Nephrodium patens Desv. = *Aspidium patens* Swartz.
Nymphæa ampla DC. = *Castalia ampla* Salisb.
Cyperus polystachys Rottb. = *Cyperus fugax* Liebm.
Mollugo glinus A. Rich. = *Glinus loloides* Loebl.
Tetramerium scorpioides Hemsl. = *Henrya scorpioides* Nees.
Kosteletzkya sagittata Presl. in part. = *Kosteletzkya asterocarpa* Turcz.
Panicum microsperrum Fourn. = *Panicum trichanthum* Nees.
Paullinia velutina DC. = *Paullinia fuscescens* Kunth.
Nephrodium conterminum Desv. = *Phegopteris tetragona* Fee.
Sida carpinifolia L. f. = *Sida acuta carpinifolia* K. Schum.
Verbena caroliniana L., in part. = *Verbena polystachya* H. B. K.
Bastardia hirsutiflora Presl = *Wissadula* sp.

CATALOGUE OF SPECIES.

RANUNCULACEÆ.

Clematis sp. An abundant bloomer, flowers white and sweet scented. Manzanillo, December 1 to 31, 1890. No. 992.

Clematis sp. A strong, high climber, covering fences and trees. The fruit is similar to that of the above species, but the leaves are thicker. Along water courses. Colima, January 9 to February 6, 1891. No. 1113.

DILLENIACEÆ.

Tetracera volubilis L. Sp. Pl. i. 533 (1753). A high climbing shrub, its large stems often prostrate for a long distance, either straight or coiled; flowers in large axillary or terminal panicles. Common in wet bottoms across the bay from Manzanillo, March 2 to 18, 1891. No. 1044.

The fruit of our plant is somewhat different from that of this species and it ranges farther northward, but it seems to answer to this better than any other. It is called "Beyuco de agua." The stems when cut give forth a large quantity of clear, sweetish water, with which travelers often quench their thirst.

MENISPERMACEÆ.

Cocculus diversifolius DC. Syst. i. 523 (1818). Low climber. Colima, January 9 to February 6, 1891. No. 1111.

Cissampelos pareira L. Sp. Pl. ii. 1031 (1753). Colima, January 9 to February 6, 1891. No. 1140.

NYMPHÆACEÆ.

Castalia ampla Salisb. Parad. Lond. i. 73, t. 14 (1805); *Nymphæa ampla* DC. Syst. ii. 54 (1821). Strongly fixed in the mud by long fleshy white roots: leaves above dark olive, beneath dark cherry, and with very conspicuous veins, 12 inches or more in diameter; petals white; stamens yellow; fruit olive-green, depressed, 2½ inches in diameter. At the mouth of a creek where it enters the lagoon. Manzanillo, March 2 to 18, 1891. No. 1392.

This plant is figured in Curtis's Botanical Magazine, t. 4469.

CRUCIFERÆ.

Nasturtium tanacetifolium (Walt.) Hook. & Arn. Journ. Bot. i. 190 (1834); *Sisymbrium tanacetifolium* Walt. Fl. Car. 174 (1788). Flowers said to be white; only three small plants collected. Rich bottoms near Manzanillo, March 2 to 18, 1891. No. 1344.

CAPPARIDACEÆ.

Gynandropsis pentaphylla (L.) DC. Prod. i. 238 (1824); *Cleome pentaphylla* L. Sp. Pl. ed. 2. ii. 938 (1763). About 2 feet high; sparingly found about the lagoon, probably introduced. Manzanillo, December 1 to 31, 1890. No. 973.

Capparis cynophallophora L. Sp. Pl. ed. 2. i. 721 (1762). A loose-growing shrub, 10 to 12 feet high. Collected near the base of the mountains at Manzanillo, January 9 to February 6, 1891. No. 1068.

Capparis palmeri Rose, sp. nov. A compact shrub, 8 feet high: leaves oblong, acute or obtuse, cordate at base, on very short, puberulent petioles, dull green on both sides; veins not prominent: petals white, 6 to 8 lines long: stamens about 60, 15 lines long, about equal to the stipe.—On the mountain sides. Manzanillo, March 2 to 18, 1891. No. 1358.

Near *C. cynophallophora*, from which it differs in its more compact habit, smaller flowers, and leaves not strongly reticulated nor shining, cordate at base. Both species grow about Manzanillo. This species grows on the mountain sides, while *C. cynophallophora* is found in the plain, between the mountain and lagoon. The favorite habitat of the latter species is along the coast. It was collected the latter part of January in fruit, while *C. palmeri* was collected in March in flower.

Capparis sp. With the above species was sent a branch with immature fruit which differs in its larger leaves, 3 to 5 inches long, acuminate and cuneate at base, on petioles sometimes 15 lines long. No. 1358 a.

This plant very much resembles Jaquin's figure of *C. frondosa*; see Jacq. Stirp. Amer. t. 104 (1763). It may not, however, belong to this genus.

Cratæva palmeri Rose, sp. nov. A diffuse shrub, 8 feet high: leaves 3-foliolate, on petioles 2 to 4 inches long; leaflets oval to ovate, 2 to 4 inches long, slightly acuminate, rounded or cuneate at base and more or less oblique, a little roughened above and with crisp hairs beneath: inflorescence corymbose; flowers on pedicels $1\frac{1}{2}$ to 2 inches long: torus $1\frac{1}{2}$ lines long: sepals 4, oblong, 2 lines long, acute: petals 4, cuneate at base, 3 lines long, not including the long slender claw (6 to 10 lines long): stamens 16; filaments 2 to $2\frac{1}{2}$ inches long: stipe of ovary $2\frac{1}{2}$ to 3 inches long, that of fruit $3\frac{1}{2}$ to 4 inches long: fruit pear-shaped, $1\frac{1}{4}$ to 2 inches long, obtuse, often slightly appendiculate.—Armeria, February 15, 1891. No. 1285.

This plant seems very distinct from any of the other species. Dr. B. L. Robinson, who has examined it, says: "It seems to have considerable in common with *C. tapia* and *C. benthami*, but differs from both in its scurfiness, in its smaller less conspicuous lenticels, its short sublateral inflorescence and longer anthers."

Cratæva sp. A tree 40 feet high and 40 inches in diameter; fruit the size of a lime. Manzanillo, December 1 to 31, 1891. No. 1013.

Called "Zapatillo amarillo." This tree is taller than either *C. gynandra* or *C. tapia*, the only two species attributed to Mexico. The leaves are more like the former, but the fruit is larger than in that species.

Morisonia (?) sp. A small tree, 12 feet high, 3 inches in diameter: leaves oblong, acute, perfoliate near the base, thick, shining and glabrous above, stellate-pubescent beneath: fruit spherical, $1\frac{1}{4}$ inches in diameter. Manzanillo, December 1 to 31, 1890. No. 1011.

The shape and size of the fruit resembles that of the species of *Cratava* (No. 1013) collected here also. These specimens do not belong to any described species, so far as I can learn, and the genus has not been reported previously from Mexico. It seems to belong in *Morisonia*, but in the absence of flowers it is better to refer it doubtfully, as above.

Forchhammeria pallida Liebm. Kjoeb. Vidensk. Meddel. 1853. 94 (1854). A small tree, 15 to 20 feet high, 5 to 8 inches in diameter, with a large top and a great profusion of leaves: leaves $2\frac{1}{2}$ to 4 inches long, including the petioles (2 to 8 lines long), 8 to 12 lines broad: calyx of male flowers minute or wanting: in flower while in full leaf. On a sandy beach near Manzanillo, March 2 to 18, 1891. No. 1333, in flower; No. 1348, with immature fruit; No. 1366, with leaves only.

The tree is somewhat taller with the leaves larger than in the type, but in other respects it agrees with it. Only the male flowers were collected. This is a very rare plant in herbaria and has not been collected for many years. It was first seen and described by F. Liebmann, and is now collected the second time.

In habit and flowers the following new species is closely allied:



FIG. 1.—*a*, Leaf of *Forchhammeria pallida* showing the lower surface; *b*, the same as seen from above.

Forchhammeria watsoni Rose, sp. nov. A tree with large spreading top, 15 feet high, 1 to 5 feet in diameter; young branches finely pubescent: leaves coriaceous, narrowly to broadly linear, 3 to 5 inches long, 2 to 6 lines broad, more or less puberulent, cordate at base, strongly reticulated beneath, with prominent midrib and revolute margins: flowers in slender racemes 2 to 3 inches long: stamens 18 to 22: fruit pear-shaped, orange-colored, but when fully ripe a "purplish red," 5 to 6 lines long.—Common about Guaymas, Mexico, and at low elevations in the cape region of Lower California. Collected by Dr. Palmer in

1887 (No. 179); February 15, 1890 (No. 167); April 1 and 2, 1890, in flower; and July 30, 1891, in fruit. Mr. Brandegee reports it from Lower California, and has recently written me that he obtained it also at Guaymas in 1892.

For illustrations see Frontispiece and Pls. XXIV and XXV.

Considerable doubt has existed among our American botanists as to what this plant is, owing to the insufficient material which has been collected. This is the plant referred to under No. 167, on page 90 of this volume. A long note by Dr. Sereno Watson with reference to the same may be found in Proc. Amer. Acad. xxiv. 82 (1889), and another by Mr. Brandegee in Proc. Cal. Acad. ser. 2. ii. 215 (1889). The ripe fruit is much eaten by birds.

I have named this remarkable tree in honor of the late Dr. Sereno Watson, who made a careful study of the plant when it first appeared in the collection of Dr. Palmer in 1887.

In this species, which is clearly distinct from *F. pallida*, the flowers appear just after the leaves of the previous growing season have fallen and before the new leaves are put forth. In *F. pallida* the flowers and leaves appear together: in both cases the racemes of flowers arise in the axils of the old leaves. *F. pallida* seems to be clearly dioecious as described, while *F. watsoni* often has more or less developed ovaries in the staminate racemes.

Foeckhammeria has been variously placed, sometimes in *Capparidaceæ*, sometimes in *Euphorbiaceæ*, and once in *Malvaceæ*. It certainly does not belong to the latter order nor does it seem to me that it can be placed in *Euphorbiaceæ*. Prof. Radlkofer has made a very careful study of the genus, and believes that it should be retained in *Capparidaceæ*, where it was first placed by Liebmann.

BIXACEÆ.

Cochlospermum hibiscoides Kunth, Syn. Pl. .Eq. iii. 214 (1824). A tree 25 to 30 feet high. Common about Mazanillo, December 1 to 31, 1890. No. 1096. This is a beautiful flowering tree, remaining in bloom for more than two months.

Bixa orellana (?) L. Sp. Pl. i. 512 (1753). A small tree, 20 feet high, leaves mostly rounded at base, rarely truncate: fruit broader than long. Along the bay opposite the city of Manzanillo, December 1 to 31, 1890. No. 920.

Xylosma horrida Rose, sp. nov. A tree 30 feet high, 8 inches in diameter; thorns on the trunk large, often 3 to 6 inches long, branching; leaves $2\frac{1}{2}$ to $3\frac{1}{2}$ inches long, acute or slightly acuminate, broadly cuneate at base, bluntly serrate, glabrous and shining; flowers hermaphrodite in short axillary racemes; sepals small: glandular disk prominent: stamens about 20, much longer than the sepals: ovary glabrous, prolonged into a slender style; stigmas 2: seeds 2 to 6, oval in outline.—Manzanillo, March 2 to 18, 1891. No. 1340.

This species agrees with *X. intermedia*, collected in Panama, in having its flowers racemose and hermaphrodite, but this latter plant is described as a shrub 10 feet high, with large leaves, without thorns, with sepals nearly as long as the stamens and with 3 stigmas. Its nearest alliance is probably with *X. calophyllum*. I am indebted to Capt. John Donnell Smith for comparing my specimen with No. 1600 of Spruce, already referred to *X. calophyllum*, of which he writes: "Like your 1340, the spines are long and branched and the hermaphrodite flowers are racemose and glands of disk numerous, but the leaves are quite different."

Xylosma palmeri Rose, sp. nov. Dioecio-polygamous, glabrous, armed at the nodes with slender straight spines 5 to 15 lines long: leaves about 2 inches long, elliptical, cuneate at base, alternate, shining, dentate: flowers fasciculately grouped, 6 to 10 together: pedicels 4 to 5 lines long: male flowers with 4 sepals, 20 to 26 stamens set within the disk, and no style: female or hermaphrodite flowers, with a prominent disk, few or no stamens, short style; broad, peltate

stigma, and ovary with 2 parietal placenta; fruit black or red, with 2 to 4 seeds.—Near the base of the mountains about Manzanillo, December 1 to 31, 1890. Nos. 930, 930*a*, 969, 969*a*.

For illustration see Pl. XXVI.

This species was collected four different times. All the specimens are so similar in habit and leaves that I am unable to separate them. Nos. 969 and 969*a* have all the flowers staminate; in No. 930 they are pistillate or nearly so, while in 930*a* they are hermaphrodite and fertile. No. 930 is said to be a large shrub, while No. 969 is said to be a small shrub. Dr. Palmer states that the fruit of No. 930 is red, while that of 930*a* is fleshy and black. In No. 930*a* the styles become cleft to the base in the fruit.

POLYGALACEÆ.

Krameria palmeri Rose, sp. nov. Compact shrub, 2 to 3 feet high, much branched; young branches appressed-pubescent: leaves numerous, alternate, slightly pubescent, linear, 3 to 9 lines long: pedicels short, bibracteate near the middle: sepals oblong, obtuse, 3 lines long: petals 5; the 2 lower fleshy, broadly obovate, 1 line long; the 3 upper united below, the middle one ovate, the lateral ones more dilated, 2 lines long including the claw: stamens 4, slightly shorter than the upper petals: ovary glabrous: fruit globose, flattened, 4 lines in diameter, glabrous, yellowish or purplish, covered with stout naked prickles.—Scattered here and there on the gravelly plains. Agiabampo, October 3 to 15, 1890. No. 753.

For illustration see Pl. XXVII.

CARYOPHYLLACEÆ.

Drymaria cordata (L.) Willd. in Roem. & Schult. Syst. v. 406 (1819); *Holosteum cordatum* L. Sp. Pl. i. 88 (1753). In swampy places in river bottoms. Colima, January 9 to February 6, 1891. No. 1166.

Drymaria procumbens Rose, sp. nov. Annual, slender, procumbent, rooting at the nodes, puberulent throughout, except the leaves: leaves succulent, oval, 3 to 9 lines long, obtuse, on very short petioles, glabrous: flowers in diffuse pedunculate cymes: sepals 2 lines long, herbaceous with scarious margins, acute, 5-nerved at base: petals white, deeply 2-parted, two-thirds the length of the sepals: capsule few-seeded.—Near water ditches about Colima. January 9 to February 6, 1891. No. 1165.

Drymaria villosa Cham. & Schlecht. Linnaea, v. 232 (1830). Very common on clay banks in the mountains. Manzanillo, December 1 to 31, 1890. No. 945.

PORTULACACEÆ.

Portulaca pilosa L. Sp. Pl. i. 445 (1753). A very common plant everywhere about Manzanillo. March 2 to 18, 1891. No. 1375.

Portulaca sp. Erect, often 1 foot or more high, more or less branching above, purplish: leaves terete, 15 lines long, tapering towards the apex, a little hairy in the axils: flowers pink, 1 inch or more in diameter: stamens 30 to 50, much shorter than the style; filaments and style red. Agiabampo, October 3 to 15, 1890. No. 804.

This is the same as *P. pilosa*? Proc. Amer. Acad. xxi. 417. (Palmer's No. 79 of 1885.)

These plants bear numerous slender tubers similarly to *P. stelliformis*, which differs from this species in the color of the flowers, longer leaves, and a somewhat different habit. Perhaps it should be referred to *P. stelliformis* as a variety. Specimens have been cultivated by Mrs. H. L. T. Wolcott at Halifax, Mass., to whom I am indebted for some fine blooming plants.

MALVACEÆ.

Malvastrum scabrum (Cav.) Gray in Bot. Wilkes Exped. i. 147 (1854); *Malva scabra* Cav. Diss. v. 281, t. 138, f. 1 (1788). Only fruiting specimens collected. Grows in rich bottoms. Agiabampo, October 3 to 15, 1890. No. 790.

Malvastrum spicatum (L.) Gray, Pl. Fendl. 22 (1849); *Malva spicata* L. Amœn. Acad. v. 401 (1760). Very common about the lagoon at Manzanillo. December 1 to 31, 1890. No. 1040.

Malvastrum tricuspidatum (Ait.) Gray, Pl. Wright. i. 16 (1852); *Malva tricuspidata* Ait. Hort. Kew. ed. 2. iv. 210 (1812). Manzanillo, December 1 to 31, 1890. No. 1041.

Anoda hastata Cav. Diss. i. 38, t. 11, f. 2 (1785), *vide* Baker. A common plant in low places about Manzanillo. December 1 to 31, 1890. No. 909.

Anoda pentaschista Gray, Pl. Wright. ii. 22 (1853). Agiabampo, October 3 to 5, 1890. No. 780.

Gaya minutiflora Rose, sp. nov. Stems erect with many ascending branches: leaves 6 to 12 lines long (on petioles mostly 6 to 15 lines long), ovate, acute, cordate or truncate at base, dentate: flowers axillary, solitary, on peduncles (6 to 45 lines long) mostly longer than the petiole of the subtending leaf: calyx 4 lines broad with 5 ovate-acute to acuminate lobes: petals "cream-colored," 3 lines long, broadly wedge-shaped: styles 10: capsule broadly ovate, acute: carpels 9 to 10, 4 lines long, 1-seeded: seed puberulent.—Not common. Found along a creek near Colima, January 9 to February 6, 1891. No. 1167.

This is also No. 1939 of Capt. John Donnell Smith's distribution, under *G. hermannioides*, Pl. Guat. pt. 2. 6. This species resembles in habit *G. hermannioides*, but has smaller flowers, longer petioles, fewer carpels, different-shaped capsules, etc.

"I think it is perfectly distinct from *G. hermannioides* H. B. K.; in fact, it comes nearer to *subtriloba* H. B. K. We have a specimen of this latter species which was named by Mr. Triana, and which comes from New Granada, and although not very like the figure I think it must be correct. Your *minutiflora* differs from this specimen of *subtriloba* in its smaller leaves, which are acute and not acuminate, rather smaller flowers, and fewer carpels. Of course, compared with the figure in H. B. K. it seems totally different, but in our specimen the flowers are not always axillary on the main stem, but sometimes on lateral branches." E. G. Baker *in lit.*

Sida acuta carpinifolia (L.) K. Schum. Fl. Bras. xii, pt. 3, 326. (1891); *S. carpinifolia* L. f. Supp. Syst. Veg. 307 (1781). Stems about 4 feet high. Very common. Manzanillo, December 1 to 31, 1890. Nos. 908, 1130. The branches are cut and tied in bunches and used for brooms by the Mexicans.

"This approaches *S. acuta* Burm. by its narrower leaves, but is not exactly the typical form of this species." E. G. Baker. This was reported to me by Mr. Baker under the name *S. carpinifolia*, but in his recent "Synopsis of Malvæ" he has followed K. Schumann as given above.

Sida diffusa H. B. K. Nov. Gen. et Spec. v. 257 (1821). Colima, January 9 to February 6, 1891. No. 1130.

Sida dumosa Swartz, Prod. Veg. Ind. Occ. 101 (1788). Armeria, February 15, 1891. No. 1249.

Sida rhombifolia L. Sp. Pl. ii. 684 (1753). Common about the lagoon at Manzanillo, December 1 to 31, 1890. No. 1004.

Sida urens L. Amœn. Acad. v. 402 (1760), *vide* E. G. Baker. Manzanillo, December 1 to 31, 1890. No. 1004a.

Sida ulmifolia Cav. Diss. i. 15, t. 2, f. 4 (1785), *vide* Baker. Manzanillo, December 1 to 31, 1890. No. 936.

Sida glutinosa Cav. Diss. i. 16, t. 2, f. 8 (1785), *forma*, *vide* Baker. Colima, January 9 to February 6, 1891. No. 1109.

Sida sp. Manzanillo, December 1 to 31, 1890. No. 1003.

"I am rather puzzled with this plant. It is, of course, a *Sida* and comes near *Sida aggregata* Presl, Reliq. Haenk. We have not the type of this, so I have only the description to go by. It also comes rather near a plant I described as *S. barelayi*, but has totally different leaves. It may be new." E. G. Baker.

Wissadula rostrata Planch. in Hook. Fl. Nig. 229 (1849). Carpels 3 or 4. Found along fences in river bottoms. Colima, January 9 to February 6, 1891. No. 1137.

Wissadula hirsutiflora (Presl): *Bastardia hirsutiflora* Presl, Reliq. Haenk. ii, 112 (1836). Colima, February 27 and 28, 1891. No. 1307.

When I first studied this plant, more than two years ago, I considered it a new species of *Wissadula*, and so sent it to Mr. E. G. Baker, who was then preparing his Synopsis of Malvæ. He reported it as the *Bastardia hirsutiflora* of Presl. While my plant does not answer to Presl's description in all respects, Mr. Baker is doubtless right in considering them the same. One thing, however, seems certain, and that is that Presl's plant belongs with *Wissadula* rather than with *Bastardia*, although Mr. Baker (see Journ. Bot. xxxi. 68) still retains it in the latter genus.

It differs from *Bastardia* in having three styles and carpels instead of five, three ovules instead of one in each cell, and the carpels constricted with an internal projection. It is like *Wissadula*, in having the peculiar carpel structure of that genus, but the carpels are rounded at the apex and only three in number. The flowers are violet instead of yellow. While these differences may not be sufficient to establish a generic separation from *Wissadula*, yet in the light of other material which I have studied they seem to suggest a good subgenus.

Either there are several valid species belonging to this group, or *W. hirsutiflora* is an extremely variable species. One of these forms is *Abutilon* (*Wissadula*) *cinctum* Braudegee, Zoc. iii. 348 (1893), collected at Las Duranillas, Sonora, and with it should probably be referred Palmer's No. 38 (1890) from Alamos. These specimens have small rounded leaves, merely acute, with short petioles, and the pubescence is short and dense throughout except some pilose hairs on the calyx. Another form, and it certainly seems specifically distinct from that above, is Mr. Pringle's No. 4610 (1893) from the state of Jalisco, which he has recently distributed as a new species of *Wissadula*. The stems are covered with pilose hairs, and the leaves, which are much larger, gradually taper from near the base into a long acumination. In the same distribution (No. 4578) is another form, near the last, but with slightly different pubescence. Palmer's Colima plant has thinner, broader leaves, with a broad, open sinus, and an abrupt acumination. Still another form is Palmer's No. 1720 from Ymala, which has not yet been distributed.

Abutilon bastardioides Baker fil. ms.; caule vel ramo ligneo terete, foliis cordato-ovatis acutis vel acuminatis serratis 7-9-palmatis-nervatis membranaceis utrinque tenuiter stellato-pubescentibus petiolis quam laminis longioribus vel subæquilongis, floribus paniculatis, paniculis foliosis laxis, pedunculis gracilibus teretibus circa medium articulatis, alabastris calyceibusque externe brunneopiloso-pubescentibus, sepalis lanceolatis vel ovatis acutis vel acuminatis, carpellis 4-5 in capsulam loculicidem connatis, carpellis trioovulatis intus nudis apice muticis.—Hab. Mexico Colima. February 27 and 28, 1891. No. 1314.

Stem or branches woody, canescent, terete except at the apex: leaves cordate, ovate, acute or acuminate, serrate, generally slightly broader than long; $1\frac{1}{2}$ to 2 inches long, $1\frac{1}{2}$ to $2\frac{1}{4}$ inches broad; on both sides finely stellately pubescent, palmately 7-nerved, petioles as long as or longer than the lamina: panicle lax, leafy: peduncles terete, articulated generally about at the middle, above the articulation covered with brown somewhat glandular pubescence, often bent at the articulation: calyx tube campanulate, sepals lanceolate or ovate, acute or acuminate, externally together with the tube covered with brown glandular and pilose pubescence: petals obovate, longer than the sepals ($\frac{1}{2}$ inch long): staminal column, especially below, covered with stellate white hairs, about 3 lines long:

stigma capitately stigmatose: capsule composed of 4 or 5 carpels, loculicidally dehiscent, externally incano-pubescent, about $\frac{1}{2}$ inch high, shorter than the calyx: carpels 3-ovuled, muticous: seeds black, sparsely pubescent. This plant approaches the genus *Bastardia* in the structure of its fruit, there being 4 or 5 carpels which are entirely muticous and united so as to form a loculicidally dehiscent capsule.

Abutilon incanum (Link) Sweet, Hort. Brit. 53 (1827); *Sida incana* Link, Enum. Plant. ii. 204 (1822), *vide* Baker. Armeria, February 15, 1891. No. 1281. Agiabampo, October 3 to 15, 1890. No. 768.

Dr. Palmer writes as follows of this plant: "The natives call this plant 'Tornado,' which signifies popping of the leaf. It grows about 8 feet high, acquiring the greatest perfection upon rich bottom lands. It yields a strong, durable fiber, which the Zotluhuacac Indians, who live 40 miles southeast of Manzanillo, utilize in making hammocks, ropes, and carrying-nets, which are so durable that they last from seven to ten years when in constant use."

According to Dr. Palmer, the fiber is prepared as follows: "When the plant is mature, the lateral branches are cut away and the stems are buried in the mud at the edge of Lake Alcuazagua (Lake of the Devil). Three to four days afterward the plants are removed and washed, and are then ready for the stripping of the inner bark or fiber. This is done in the following manner: The workman, standing upright, with the stem which rests firmly upon the ground in his left hand, presses the right thumb firmly upon the stick, and taking the fiber between the fingers, he pulls steadily, bending gradually to the work until he falls upon his knees. When the fiber is removed the stem rebounds and flies over the shoulder of the operator, stripped of half its bark. This seems a very slow process, but jute was formerly cleaned as slowly, and it was only after many and repeated trials that machinery was perfected to perform this tedious work. Probably this, like jute, if allowed to die before cutting, would become brittle, and fit only for paper manufacture; therefore, in more northern latitudes it may be best to cut the plants before frost. Experiments will be necessary to ascertain the proper time for cutting, the length of time it should be immersed, if water will accomplish the same result as mud, rendering the bark soft and pliable."

Abutilon triquetrum Presl, Reliq. Haenk. ii. 115 (1836), *vide* Baker. Along rich bottom. Agiabampo, October 3 to 15, 1889. No. 810.

Abutilon sp. Colima, February 27 and 28, 1891. No. 1314.

Malachra radiata L. Syst. Veg. 518 (1767); *Sida capitata* L. Sp. Pl. ii. 685 (1753). Manzanillo, December 1 to 31, 1890. No. 958.

Malachra capitata L. Syst. Veg. 518 (1767); *Sida radiata* L. Sp. Pl. ed. 2. ii. 965 (1763). Manzanillo, December 1 to 31, 1890. No. 962.

Malvaviscus arboreus Cav. Diss. iii. 131, t. 48, f. 1 (1787), *vide* Baker. A very showy shrub, 10 to 12 feet high: leaves 3 to 6 inches long (petioles 2 to 4 inches long), ovate, sometimes subtrilobate, crenate, slightly cordate or truncate at base. The fruit, which is edible, is at first red, but becomes yellow when mature. The shrub is called "Monacillo," while the fruit is known as "Manzanita." Manzanillo, December 1 to 31, 1890. No. 963.

"This plant certainly does not agree with Cavanille's description of *arboreus* where the leaves are described as '3-5-lobis,' but I think it comes near this species." E. G. Baker *in lit.*

Kosteletzkya asterocarpa Turcz. Bull. Soc. Mos. xxxi. pt. 1. 191 (1858), *vide* Baker. Branches slender, hispid with spreading hairs or stellate-pubescent: leaves narrowly lanceolate to linear, serrate, acute, $1\frac{1}{2}$ to 4 inches long, stellate-pubescent, truncate at base or with one or two auricles or lobes; petioles 3 to 6 lines long: peduncle 10 to 20 lines long: flowers small, yellow: involucre of 8 to 9 filiform bractlets shorter than the calyx: sepals 2 lines long, obtuse: capsule 5-celled, hispid on the angles. Collected from a garden at Manzanillo, March 2 to 18, 1891. No. 1362.

Kosteletzkya sagittata Presl, Reliq. Haenk. ii. 131, t. 70 (1836). Probably this species or one closely related to it. About 3 feet high: leaves sometimes truncate at base: flowers small, "white, shaded with pink," drying a yellowish green: staminal tube short: seeds with short crisped hairs. Only one plant seen, near a lagoon.* Manzanillo, December 1 to 31, 1890. No. 951.

Hibiscus coulteri Harvey in Gray, Pl. Wright. i. 23 (1852). "Flowers canary color with purple base." Collected along a creek bottom at Agiabampo, October 3 to 15, 1890. No. 779.

Hibiscus sabdariffa (?) L. Sp. Pl. ii. 695 (1753). About 4 feet high, nearly glabrous: leaves simple or deeply 3-cleft, dentate, 3 to 5 inches long: flowers axillary, solitary on short (3 to 4 lines long) peduncles: involucre gamophyllous, 10-cleft: calyx 12 to 18 lines long, deeply 5- to 6-cleft into ovate, acuminate divisions, dark purple: corolla spreading to $1\frac{1}{2}$ inches, yellow with a black or purplish eye: style 5-cleft; stigma capitate: capsule globular, 6 to 9 lines long, 5-celled: cells 4- to 7-seeded. Cultivated at Manzanillo, but said to be native. December 1 to 31, 1890. No. 1065.

Dr. Palmer says: "The stems, involucre, and capsules are copper-red. The Mexicans gather the fleshy capsules and use them after drying to make a cool, refreshing drink. This is an important article of commerce and is sold all over Mexico."

I have grown this plant in my grounds, but was not successful in getting it to flower. The young plants are a bright purple and the leaves are all simple.

Hibiscus tiliaceus L. Sp. Pl. ii. 694 (1753). Very common along the banks of a ravine at Manzanillo, December 1 to 31, 1890. No. 1054.

Hibiscus (Bombycella) sp. Shrubby 4 feet high: leaves mostly 3-lobed, serrate; central lobe acute or acuminate: peduncles 2 to 3 inches long, longer than the leaves: involucre bracts 11, cleft to the base, linear, 3-nerved, longer than the capsule: calyx cleft below the middle, shorter than the capsule: capsule globose, 5-celled, 4 lines long, pubescent with appressed hairs at the top: seed with long cottony, dirty-white hairs. Not found in flower. Under brush along a creek. Agiabampo, October 3 to 15, 1890. No. 776

Near *H. phariceus* var. of Palmer's 1885 collection, but differing in having lobed leaves, longer peduncles, shorter and more globose capsule, etc.

Cienfuegosia palmeri Rose, sp. nov. An upright shrub, 6 to 8 feet high: leaves heart-shaped, acuminate, 2 to 4 inches long, on petioles 1 inch or less long: flowers axillary on short peduncles: bractlets 3, minute, 3 lines long with a small pit at the base without: calyx cup-shaped, 4 lines long, with 5 small acute or acuminate teeth, black-dotted: corolla large, white with dark purple center, or becoming purplish throughout in age: petals 2 inches long: staminal column elongated, bearing anthers throughout its entire length except near the base: style clavate, slightly 2-lobed: capsule oblong, 1 inch long, apiculate, black-dotted, glabrous, 3-celled: seeds several in each cell, lanate, ovoid.—In shady woods about Colima, February 27, 1891. No. 1316.

This plant has much the habit of *Hibiscus*, but its relationships are evidently with the above genus

Ceiba (Euone) grandiflora Rose, sp. nov. A small tree, 15 to 20 feet high, 8 to 12 inches in diameter: branches covered with short straight prickles, mostly infra-stipular: petioles 2 to 4 inches long; leaflets glabrous, 3 to 5, oblong, cuneate at base (sometimes tapering into a petiolule), obtuse or acute, entire or slightly serrulate, 2 to $3\frac{1}{2}$ inches long: calyx narrowly campanulate, 8 to 10 lines long, with 3 small equal obtuse teeth, glabrous without, silky within: petals white, silky, especially without, strap-shaped, 4 to 5 inches long: stamens 5; filaments long ($3\frac{1}{2}$ inches), each with 2 anthers, united at base into a tube 9 lines in length with 5 small teeth at its apex: style glabrous: capsule oblong, $4\frac{1}{2}$ inches

long.—In rich valleys and in the mountains about Manzanillo December 1 to 31, 1890. No. 1050.

Called "Pochote" or tree cotton. Dr. Palmer says: "The flowers are borne at the extremity of the branches; they are fleshy with a waxy appearance, at first white, then changing to brown (snuff color) before falling."

This species seems nearest *C. rosca* Schum., but is not so tall and has larger, differently colored flowers. We have followed Dr. K. Schumann in taking up the name *Ceiba* in place of *Eriodendron*.

STERCULIACEÆ.

Physodia corymbosa Presl, Reliq. Haenk. ii. 150, t. 72 (1836). About 10 feet high with a few weak stems leaning for support on adjacent shrubs. Colima, February 27 and 28, 1891. No. 1372.

Palmer's plant from Jalisco (No. 86), 1886, has acuminate sepals and may be designated variety *acuminata* var. nov. Dr. K. Schumann refers this genus to *Melochia* in Engler & Prantl, Pflanzenf. iii. teil, 6 abt. 80, but it seems very distinct from our Mexican and North American species of that genus.

Melochia pyramidata L. Syst. ed. 10. ii. 1140 (1759). This plant has several slender stems from the base: flowers pink. Common in level places at the base of the mountains. Manzanillo, December 1 to 31, 1890. No. 912.

Melochia plicata Presl, Reliq. Haenk. ii. 145 (1836). Few stems from the base, erect, 5 feet high or less: flowers rose-colored. Common on the sides of the mountains. Manzanillo, December 1 to 31, 1890. No. 956.

This seems to be the old species collected by Haenke at Acapulco, which, so far as I can learn, has not since been found.

Its resemblance to *M. tomentosa* is striking, but it is easily distinguished by the fruit.

Waltheria detonsa Gray, Pl. Wright. ii. 24 (1853). Partly prostrate. A common plant between the mountains and the lagoon. Manzanillo, December 1 to 31, 1890. No. 1039.

Waltheria americana L. Sp. Pl. ed. 2. ii. 941 (1763). A common plant about the lagoon at the base of the mountains. The Mexicans use a decoction of the leaves for washing wounds. Manzanillo, December 1 to 31, 1890. No. 961.

Guazuma ulmifolia Lam. Encyc. iii. 52 (1789). A medium-sized tree, 25 feet high and 1 foot in diameter. Manzanillo, December 1 to 31, 1890. No. 960.

It is called "Guacima," and is used in many ways by the Mexicans as a medicine. The fruit is often eaten.

Ayenia manzanilloana Rose, sp. nov. Fruticose: leaves lanceolate, acute, serrate, 10 to 20 lines long, slightly pubescent: flowers 1 to 5 in the axils of the upper leaves: peduncles (pedicels) 4 to 8 lines long: sepals ovate, acute: petals with 2 small teeth close to the point of union with staminal cup, and with a long appendage on the back tipped with brown: anthers 3-celled: ovary on a stipe, 1 line long, glabrous except the numerous brown glands.—Very common in the mountains. Manzanillo, December 1 to 31, 1890. No. 940.

Ayenia pusilla L. Syst. ed. 10. ii. 1247 (1759). Common in shade near the lagoon. Manzanillo, December 1 to 31, 1890. No. 976.

Buettneria cartilagenensis Jacq. Stirp. Amer. Piet. 41 (1780). Manzanillo, December 1 to 31, 1890. No. 1026.

TILIACEÆ.

Triumfetta semitriloba L. Mant. i. 73 (1767). Variable in height up to 5 feet. In various parts of the mountains. Manzanillo, December 1 to 31, 1890. No. 902.

It is called "Abrojo." The roots are used for diseases of the liver, kidneys, and spleen.

Heliocarpus tomentosus Turcz. Bull. Soc. Nat. Mosc. xxxi. pt. 1. 225 (1858). A small tree, 15 to 30 feet high, 3 to 5 inches in diameter, with a very large top and a great abundance of fruit. Very common all over the mountains. Manzanillo, December 1 to 31, 1890. No. 986.

The plant was collected in fruit only, and is tentatively referred here. It is not nearly so pubescent as our herbarium specimens nor as the original description requires, and fuller material may show it to be a new species.

Corchorus acutangulus Lam. Encyc. ii. 104 (1786). Only a single specimen found near the base of the mountains. Manzanillo, December 1 to 31, 1890. No. 944.

I have thus referred my plant, although I have seen no specimens of the species otherwise nor have I any knowledge of its having been reported from Mexico before. Wight's figure (Icon. t. 739) shows numerous stamens, while the single flower on my plant had but 10 stamens.

Corchorus siliquosus L. Sp. Pl. i. 529 (1753). Only a few plants found near a water-ditch. Colima, January 9 to February 6, 1891. No. 1231.

Corchorus pilolobus Link. Enum. Hort. Berol. ii. 72 (1822). Only a single plant found near the base of the mountains. Manzanillo, December 1 to 31, 1890. No. 922. Also found in a creek bottom at Agiabampo, October 3 to 15, 1890. No. 763.

MALPIGHIACEÆ.

Malpighia ovata Rose, sp. nov. Shrub, 3 to 15 feet high, glabrous throughout, or a little hairy in the inflorescence: leaves opposite, broadly ovate, acuminate, slightly tapering at base to truncate or even a little cordate, pale beneath, somewhat reticulated, 2 to 2½ inches long, 1½ to 2 inches broad, on very short but distinct petioles: flowers in small axillary umbels or corymbs; peduncles short; pedicels 3 to 5 lines long, jointed and 2-bracteate near the middle, the upper half thickened in age: calyx 10-glandular: petals 5, cuneate at base into a slender claw: stamens 10, slightly united at base, glabrous: anthers obtuse: styles 3, obtuse: drupe 3-pyrenous, 4 lines in diameter: pyrene carinate, with 5 horizontal crests.—Manzanillo, December 1 to 31, 1890. No. 900.

For illustration see Pl. XXVIII.

Malpighia umbellata¹ Rose, sp. nov. A large shrub 8 feet high, intricately much branched: leaves glabrous or when young pubescent with appressed hairs, obovate to oblong, obtuse to retuse, mostly tapering toward the base, 10 to 18 lines long, 4 to 8 lines wide: fruit in small umbel-like clusters, either sessile or on very short peduncles: pedicels 9 to 12 lines long, jointed considerably below the middle: flowers not seen: calyx 5- to 8-glandular: drupe red, ovate to oval, 2 to 3 lines in diameter.—Agiaampo, October 3 to 15, 1890. No. 799.

For illustration see Pl. XXIX.

The fruit is edible and is called Mulberry or "Mora de Campo."

Bunchosia sp. A small tree, 10 to 14 feet high, 3 to 4 inches in diameter, with large symmetrical top: leaves glabrous (sometimes with a few hairs beneath), 3 to 5

¹Very near the above species is **Malpighia watsoni** (*Bunchosia parviflora* Watson, Proc. Amer. Acad. xxiv. 42), but the latter differs in the following points. It is a small shrub 3 to 4 feet high, leaves acute with rounded base, the calyx with more glands, the fruit much larger and the pyrene more sharply ribbed, etc. This species seems clearly to belong to *Malpighia* rather than to *Bunchosia*, from which it differs in its distinct styles, cristate pyrene, and pink flowers.

This species may properly bear Dr. Sereno Watson's name as *M. parviflora* has already been used by Jussieu.

I would also refer as **Malpighia guadalajarensis** Palmer's No. 490, from Jalisco collected in 1886, the type of *Bunchosia guadalajarensis* Watson, Proc. Amer. Acad. xxii. 401.

inches long, 2 to 3 inches broad: calyx 8-glandular: drupe "yellow," or reddish, fleshy, compressed, acute, glabrous, 7 to 8 lines broad, 2-pyrenous. Manzanillo, December 1 to 31, 1890. No. 1064.

Dr. Palmer says, "It resembles a magnolia tree; its large leaves and large handsome clusters of yellow fruit should recommend it for cultivation in our Southern States."

It is nearest *B. palmeri*, but has broader and glabrous leaves, and 8- (instead of 10-) glandular calyx, with differently shaped fruit and more compact inflorescence.

It seems to be a good species.

Bunchosia sp. Small tree, 10 to 12 feet high, with glabrous branches: leaves oblong, acute, tapering and a little oblique at base, without glands, glabrous above, with a few scattered, appressed hairs beneath (more pubescent when young), $1\frac{1}{2}$ to $2\frac{1}{2}$ inches long, including the petiole (3 to 6 lines long), 1 to $1\frac{3}{4}$ inches broad: racemes 1 to 3 in each axil, 3 to 4 inches long, including the peduncle (6 to 18 lines long), canescent: pedicels 3 to 6 lines long, jointed near the base and bearing 1 or 2 glands near the joint: calyx 8-glandular; sepals oblong, obtuse, pubescent: petals yellow, 4 lines long, including the claw: stamens 10, nearly equal, connate for one-third of their length: anthers obtuse; styles connate: stigma peltate: drupe "orange," dry, compressed-globose, pubescent, 2-pyrenous, 6 lines broad. Manzanillo, December 1 to 31, 1890. No. 1056.

This species is near *B. palmeri* Watson, but has different leaves, number of glands, calyx lobes, ovary, and fruit. This tree grows on the mountain side. It has a very irregular top.

Echinopterys lappula Juss. Arch. Mus. Par. iii. 342 (1843). Colima, February 27 and 28, 1891. No. 1308.

Heteropterys* *gayana* Juss. Arch.

Mus. Par. iii. 439 (1843), *vide* Hemsley. A tall climbing shrub with large fruit clusters: samaras sometimes 2 but mostly single, "bright cherry color above,

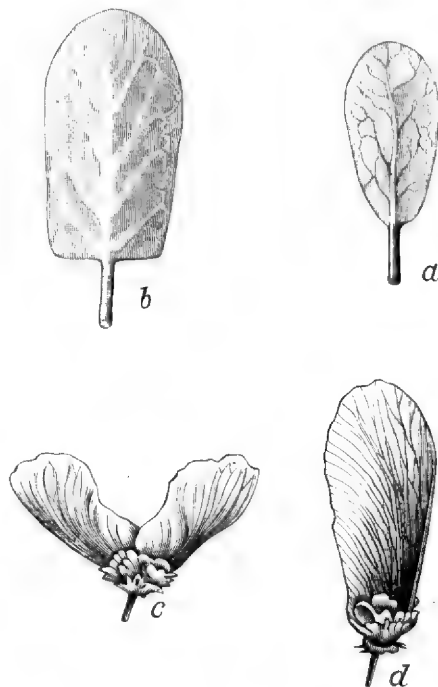


FIG. 2.—a, Petal of *Heteropterys palmeri*; b, petal of *H. portillana*; a and b enlarged; c, samara of Palmer's No. 656 (*H. palmeri*); d, samara of Palmer's No. 1025 (*H. gayana*); c and d natural size.

**Heteropterys palmeri* Rose, sp. nov. This species differs from *H. portillana* in the following particulars: leaves lanceolate to ovate, 2 to 3 inches long, 9 to 12 lines broad, obtuse or acute; petioles and base of blade without glands or with an occasional one; petioles 3 to 6 lines long: flowers in panicles of small corymbs: pedicels slender: flowers and glands smaller: sepals shorter: petals 4, oblong to obovate, 2 lines long, reflexed with cuneate base and short claw; the fifth petal larger with thick claw and erect: samaras mostly 2; dorsal wing 9 lines long.—Alamos, 1890. Nos. 655, 656.

This is the *H. portillana*, p. 95 of this volume.

old-gold below," with several small lateral crests; dorsal wing 12 to 15 lines long. Only a single plant seen near the base of the mountains. Manzanillo, December 1 to 31, 1890. No. 1025.

These specimens are only in fruit.

The flower characters of *H. portillana*, a closely related species, are here added: sepals 5, $1\frac{1}{2}$ lines long, obtuse; glands 8; petals 5, $2\frac{1}{2}$ lines long including the short claw; blade oblong with truncate or sagittate base, with a thick midrib.

Bourgeau's No. 3112, referred to *H. gayana* in Biol. Cent.-Amer., seems to be *H. beechyana*.

Hiraea mexicana Rose, sp. nov. Shrub with slender hanging branches, sometimes trailing over bushes: young branches lanate-pubescent, becoming glabrate with age: leaves opposite, oblong to oval, obtuse or acutish with rounded or somewhat tapering base, somewhat pubescent beneath (lanate or soft-silky when young), glabrous above (a little pubescent when young), $2\frac{1}{2}$ to $3\frac{1}{2}$ inches long, 1 to $1\frac{1}{4}$ inches broad; petioles pubescent, 3 to 8 lines long, with 2 glands near the middle: flowers in 3- to 6-flowered umbels or corymbs: peduncles slender: pedicels 6 to 9 lines long, pubescent: calyx with 8 large glands: petals yellow, 4 or 5 lines in diameter, denticulate, with a claw 1 line long: stamens 10, short, nearly equal; the filaments unequally connate above the middle; anthers obtuse: styles 3: samaras pubescent, with 3 wings, these equal or nearly so (central one sometimes more prominent), $1\frac{1}{2}$ inches broad, 2 to $3\frac{1}{4}$ inches long.—Armeria, February 15, 1891. No. 1275.

For illustration see Pl. xxx.

In foliage and flowers this species is nearest *H. greggii*, but it has much larger fruit, and is apparently distinct.

ZYGOPHYLLACEÆ.

Tribulus grandiflorus (Torr.) Benth. & Hook. Gen. Plant. i. 264 (1862); *Kallstromia grandiflora* Torr. in Gray, Pl. Wright. i. 28 (1852). Plant procumbent. Found in rich bottoms. Agiabampo, October 3 to 15, 1891. No. 783. Also on grassy plains, though not common. Colima, January 9 to February 15, 1891. No. 1110.

Tribulus maximus L. Sp. Pl. i. 386 (1753). Agiabampo, October 3 to 15, 1890. No. 786.

GERANIACEÆ.

Oxalis berlandieri Torr. Mex. Bound. Surv. 41 (1859). Only a few plants found along a mountain trail. Manzanillo, December 1 to 31, 1890. No. 1008.

The finding of this rare Texan plant in central Mexico is interesting and it should be looked for further north. This species had not been collected since the Mexican Boundary Survey was published, until Pringle and Nealley got it in 1890.

RUTACEÆ.

Monniera trifolia L. Sp. Pl. ed. 2. ii. 986 (1763). In wet places along the bay, opposite the village. Manzanillo, December 1 to 31, 1891. No. 927.

This genus is not credited to Mexico by Mr. Hemsley in Biol. Centr.-Amer., nor do I find it reported anywhere from Mexico. The range of this species is given as Brazil and Guiana. It is not represented in the National Herbarium, but through the kindness of Dr. Robinson I have examined the three sheets from the Gray Herbarium.

My specimens have broader leaflets and the terminal one has a narrow cuneate base, the peduncles longer, and the two larger sepals broader, and the pellucid dots are not so conspicuous. Future study may show that this form constitutes a good variety.

SIMARUBACEÆ.

Quassia amara L. f. Suppl. Syst. Veg. 235 (1781). Only a single plant seen near the edge of woods. Manzanillo, March 2 to 18, 1891. No. 1338.

Rigiostachys bracteata Plan. Lond. Journ. Bot. vi. 30 (1847). A small tree, 10 feet high, with trunk 3 inches in diameter, bearing a large branching top; leaflets very variable in size and shape: flowers "white" or yellow: petals oblong, 4 lines long, cuneate at base: ovaries 1 or 2, 2-seeded: seeds collateral: fruit, a small drupe (?), 8 to 9 lines long: brown, glabrous, with a thin brittle integument: seed oblong, 6 lines long: cotyledons fleshy, incumbent; albumen none. Manzanillo, March 2 to 18, 1891. No. 1334.

Bentham and Hooker state that the ovules are frequently solitary. In the few cases I have examined the ovules were uniformly two. This species has not before been collected in fruit. Galleotti's specimens were only in flower and were obtained from the coast of Oaxaca about the year 1839. So far as I can learn this species has not since been collected. The position of the genus is very uncertain, as the history of it will show.

This genus was described by Planchon in Hooker's Lond. Journ. Bot. vi. 29 (1847). He places it next to *Suriana* (*Simarubaceæ*) and considers it a connecting link between the orders *Connaraceæ* and *Ochnaceæ*. He states that it has the leaves of a *Sapindus* (*Sapindaceæ*), the aspect of a *Gomphia*, and the structure of *Suriana*.

Walper in his *Annales Bot. Syst.* i. 202 (1848) refers the genus to *Connaraceæ*. and Bentham Hooker in *Gen. Plant.* i. 309 (1862) place it in *Simarubaceæ*, but speak of its doubtful affinities and suggest its probable reference to *Rosaceæ*. Baillon in *Adinsonia* x. 42 (1871) is also inclined to refer it to this latter order. Hemsley in *Biol. Centr.-Amer.* i. 173, retains it in *Simarubaceæ*.

Baillon also refers to the genus in *Hist. des Pl.* iv. 408 (translation iv. 415) and *Dict. Bot.* iii. 738.

Alvaradoa amorphoides Liebm. Kjoeb Vidensk. Meddel. 1853. 101 (1854). Colima, January 9 to February 6, 1891. No. 1245.

Prof. Radlkofer considers that this genus belongs to *Simarubaceæ* rather than to *Sapindaceæ*, to which it has generally been referred.

BURSERACEÆ.

Bursera laxiflora Watson, Proc. Amer. Acad. xxiv. 44 (1889). A small tree on the rolling hills and plains. Agiabampo, October 3 to 15, 1890. No. 797.

Bursera ovalifolia Engler, in DC. Monog. Phan. iv. 40 (1883). A tree 30 feet high with long naked trunk 1 foot in diameter, and large umbrella-like top: leaflets 1 to 5: fruit in short racemes. Manzanillo, March 2 to 18, 1891. No. 1388.

This is one of the most conspicuous trees of the mountain slopes facing the lagoon at Manzanillo.

Bursera palmeri Watson, Proc. Amer. Acad. xxii. 402 (1887). A small tree, 10 feet high, with 2 stems from the base: leaflets larger and less reticulated than in the type. Along the sandy beach. Manzanillo, December 1 to 31, 1890. No. 987.

MELIACEÆ.

Guarea palmeri Rose, Bot. Gaz. xix. 39 (1894); foliis modice petiolatis 2-6-jugis, foliolis oppositis subsessilibus e basi cuneata oblongis vel obovato-lanceolatis apice obtusis supra glabris subtus ad axillas nervorum secundariorum pilosis, paniculis simplicibus racemiformibus, calyce obtuse 4-partito, ovario glabro 4-loculari loculis uniovulatis, capsula subglobosa glabra levi, semine in arillo late rubro immerso.—In Manzanillo (*Palmer* 1391).

Arbor mediocris 5 m. alta glabra, Marte fructifera, corona lata symmetrica. Rami pallide fuscentes lenticillis concoloribus. Folia 12-26 cm. longa, Foliola

ad 12 cm. longa ad 4 cm. lata in sicco firmula pallida subopaca epunctata supra nitentia, nervis secundariis utrinque circiter 8. Rhachis cum petiolo circiter 2 cm. longo teres glabra. Panicula cum foliis coartatis. Capsula pallide fuscescens 2 cm. longa 22 mm. lata 4-locularis. Cotyledones transverse superpositi crassi, radícula inclusa, plumula minima.

Species *G. brachystachya* C. DC. et *G. filiformis* C. DC. affinis.

Trichilia colimana C. DC. Bot. Gaz. xix. 40 (1894); foliis modice petiolatis 5-6-jugis, foliolis subaequalibus petiolulatis oppositis subalternisve lanceolatis basi leviter inaequali acutis apice acute acuminatis supra subtusque densius pilosulis, paniculis fructiferis simplicibus quam folia pluries brevioribus, capsulis pedicellatis 3- vel abortu 2-valvatis, valvis late ovatis transverse rugulosis hirsutis, loculis monospermis, seminibus subglobosis arillo aurantiaco circumdatis.—In Colima (*Palmer* 1117).



FIG. 3.—A leaf of *Trichilia havanensis spatulata*, drawn natural size.

Ramuli adulti glabri, in sicco rufescentes lenticellis pallidioribus inconspicuis. Folia ad 30 cm. longa impari-pinnata. Foliola superiora ceteris parum majora ad 7.5 mm. longa ad 22 mm. lata in sicco firmule membranacea inconspicue subtiliter pellucido-punctulata, nervis secundariis subadscendentibus utrinque 10-12. Rhachis cum petiolo 7 cm. longa teres pilosula. Panicula fructifera circiter 8 cm. longa. Capsularum valvae circiter 1 cm. longae. Embryo intra sacculum persistentem extus perispermio pulverulento albo circumdatum inclusus, cotyledonibus carnosus ellipticis, radícula exserta brevi obtusa, plumula minima.

Trichilia havanensis spatulata Rose, var. nov. Small tree, 15 to 20 feet high with a very large top: leaves small with long cuneate base, becoming spatulate.—Colima, January 9 to February 6, 1891. No. 1136.

Called "Garrapatilla."

M. C. de Candolle, to whom I afterwards submitted the plant, writes me as follows:

"I quite agree with you as to the specimen (*Palmer's* No. 1136) which you have sent to me. It differs from *Trichilia havanensis* by its narrower leaflets only, and must accordingly be taken as a variety of that species—*T. havanensis spatulata* as you propose."

Trichilia palmeri C. DC. Bot. Gaz. xix. 3 (1894); foliis parvis modice petiolatis 3-foliolatis, foliolis petiolulatis lanceolatis basi 'aequal' acutis apice breviter obtuse cuspidatis supra glabri subtus velutino-puberulis, paniculis glabris breviter ramulosi fructiferi quam folia multum brevioribus plerumque monocarpinis capsulis apice ramulorum sessilibus globosis parvis, valvis ovato-acutis glabris extus nigrescentibus lenticellis pallidis numerosis conspersis, seminibus ellipticis.—In Mexico (*Palmer* 1, 292).*

Februario fructifera. Ramuli glabri pallide fuscescentes lenticellis albis conspersi. Folia ad 9 cm. longa. Foliola in sicco firmo-membranacea inconspicue subtiliter pellucido-punctulata subpellucida, terminalia 7.5 cm. longa 3 cm. lata lateralibus parum minora, nervis secundariis subadscendentibus suboppositis utrinque 8-10. Petioluli ad 6 mm. longi subtiliter puberuli. Petioli ad 2 cm. longi. Paniculae hornotinae axillares glabrae. Capsula paulo latior quam longa, circiter 7 mm. lata. Semina circiter 4 mm. longa elliptica in sicco flavicantia. Embryo perispermio albo tenui inclusus, cotyledonibus carnosus basi cordulatis, radícula exserta subrotunda, plumula minima.

*Dr. Palmer collected *T. spondioides* Swartz on the Alamos Mt. March 25 to April 8, 1890 (No. 309), but it was not given in my report on that collection.—J. N. R.

Species sicut subsequens ac tertia e Guatemala alio loco describenda semine perispermium includente radículaque e cotyledonibus exserta a cæteris *Trichiliis* quorum fructus notus est discrepans.

RHAMNACEÆ.

Zizyphus mexicana Rose, sp. nov. A tree 25 feet high, 9 inches in diameter, with large, dense top; spines straight and scattered; leaves oblong, 2 to 3 inches long, strongly 3-nerved, coriaceous, glabrous, obtuse or retuse, cuneate or rounded at base, crenately toothed; petioles 3 to 8 lines long; peduncle 6 lines long; flowers 8 to 10 in a small umbel; peduncle and pedicels (as well as young leaves and branches) a little pubescent; calyx nearly glabrous, 5-parted; petals 5, small; stamens 5: fruit drupaceous, 6 to 8 lines in diameter.—On hills about Armeria, February 27 and 28. No. 1278.

This species seems nearest *Z. guatemalensis*, but it is a small tree, with leaves commonly cuneate at base, and longer petioles and peduncles. Mr. Hemsley writes me that the species is quite distinct. The fruits are gathered by the Mexicans and sold in the markets by the dozen. They are used in the place of soap and are highly prized for washing woolen goods. They are called "Amole."

Karwinskia humboldtiana Zucc. Nov. Stirp. fasc. 1, 353 (1832). A compact shrub 10 to 12 feet high. Manzanillo, December 1 to 31, 1890. No. 959.

Called "Margareta." The twigs and leaves are much used in cases of fever, etc.

Karwinskia parvifolia Rose, sp. nov. Large bush, 5 to 10 feet high, glabrous throughout: leaves opposite or subopposite, small, oblong, or linear-oblong, about 1 inch long on short petioles, obtuse, rounded, or somewhat tapering at base, the margin somewhat black-dotted; stipule minute; pedicels short; peduncles short or none; stigma 2-lobed: fruit mostly single, axillary, black, 2-celled.—Agiabampo, October 3 to 15, 1890. No. 773.

For illustration see Pl. XXXI.

This plant is not in flower, but it has all the indications of being a *Karwinskia*. It differs from *K. humboldtiana* in its much smaller leaves, the fruit more tapering at base, its larger disk, etc.

Mr. Hemsley writes me that it is not Coulter's (No. 3) from Sonora, nor is it represented in the Herbarium at Kew.

Colubrina arborea (?) Brandegee, Zöf, iv. 401 (1894). Along the edge of thick woods. Armeria, February 15, 1891. No. 1293.

Dr. Palmer says this tree has the habit of the weeping willows. Its long hanging branches are loaded with fruit. I have referred this plant as above with some doubt. I at first described it as a new species, but since then Mr. Brandegee has described a species from Lower California under the above name, to which my plant probably belongs.

AMPELIDACEÆ.

Cissus sicyoides L. Syst. ed. 10. ii. 897 (1759). Trailing over bushes along the lagoon. Manzanillo, December 1 to 31, 1890. No. 1075.

Cissus sp. Leaflets 3. Agiabampo, October 3 to 15, 1890. No. 784.

SAPINDACEÆ.

Serjania fuscopunctata Radlkofe, sp. nov. Scandens, fruticosa, subincano-pubescent; rami canaliculato-6-sulcati, ad angulos pilis patulis cano-pubescentes, cortice subfusco; corpus lignosum simplex, sulcatum; folia biternata (interdum foliolorum terminalium conformatione transitum in supradecomposita indicantia); foliola ovata, acuta, mucronulata, basi rotundata vel sub-

cordata in petiolulos abrupte contracta, integerrima vel (lateralia praesertim) utrinque grosse 1-2-dentata, penninervia, utrinque pubescentia glandulisque microscopicis adspersa, membranacea, e viridi fuscescentia, punctis pellucidis fuscis a latere superiore impressis notata, epidermide mucigera (paginae superioris quoque stomatibus instructa); petioli nudi, petioluli submarginati; thyrsi rhachi abbreviata subcorymbiformes, dense cincinniferi; cincinni stipitati; flores majusculi, flavescentes; sepala omnia canescenti-tomentella; fructus semimaturi fusco-purpurei, maturi pallescentes, ovati vel subelliptici, basi et apice excisi, glabrati, loculis latis tumidis reticulato-nervosis, dorso carinatis ecristatis, endocarpio glabro; semen prope loculi basin insertum.

Rami thyrsigeri diametro 2-4 mm. Folia (majora) 15 cm. longa, totidem lata; foliola terminalia (petiolulo ad 2.5 cm. longo excluso) 7 cm. longa, 4.5 cm. lata, lateralialia decrescentim minora, petiolus communis 2 cm., partialium intermedius 4 cm., laterales 2.5 cm. longi; stipulae minutae, ovato-triangulares. Thyrsi 4-14 cm. longi, rhachi 2.5 cm. vix excedente; cincinni abbreviati; pedicelli 4 mm. longi, medio articulati. Flores:—Sepala interiora 4 mm. longa. Petala sepalis longiora, intus glandulis vix ullis obsita; squamae superiores petala dimidia superantes, crista divaricato-bifida appendiceque deflexa lineari dense villosa-barbata, inferiores crista subcornuta erecta instructae. Tori glandulae superiores ellipticae, laterales subconformes minores. Stamina filamenta villosiuscula, antherae glabrae. Germen ad angulos puberulum, ceterum glanduli, microscopicis obsitum; stylus puberulus; stigmata stylum subaequantia. Fructus 2.7 cm. longus, 2 cm. latus, infra loculos vix constrictus, loculis 8 mm. longis, totidem latis, subinflatis, pericarpio tenui, endocarpio papyraceo ab epicarpio plus minus solubili. Semen obovoideum, badium.

In Mexico: Palmer n. 1360! (Mauzanillo, m. Mart. 1891, flor. et fruct.)

Obs. Affinis *S. subtriplinervi* Radlk. (Sect. xi.; cf. Radlk. *Serjania* Monogr. p. 273), a qua inter alia differt partibus omnibus robustioribus, praesertim floribus duplo majoribus, nec non foliis saepius dente uno alterove instructis.

Serjania rutæfolia Radlk. (sp. nov. Scandens, suffruticosa, cano-pubescent; rami teretes, leviter 8-striati, pube brevi cana crispula induti, cortice viridi; corpus lignosum simplex, teretiusculum; folia impari-pinnata, tri-quadrifida, primis infimis nunc ipsis trijugis, jugo infimo utrinque ternato, vel biternatis, vel 5-foliolato-pinnatis, proximis 5-foliolato-pinnatis vel trifoliolatis, summis simplicibus (folio 1 inde foliola 19 ad 41 exhibente); foliola parvula, superiora subrhombea vel oblonga vel obovata, inferiora ovata vel suborbicularia, fere omnia obtusa, immo retusa, mucronulo ornata, in petiolulos attenuata vel subsessilia, integerrima vel parce inciso-dentata, pilis brevibus crispulis glandulisque microscopicis utrinque obsita, membranacea, triste viridia, punctis pellucidis parvis lineolisque notata, epidermide valde mucigera (paginae superioris quoque stomatibus instructa); petiolus communis teretiusculus, striatus, petioli partiales superiores rhacheumque segmenta superiora marginata; thyrsi solitarii, folia subduplo superantes, rhachi quam pedunculus communis subduplo longiore cincinnisque stipitatis subverticillatim approximatis pube cana crispula densa indutis; flores mediocres, albi, suaveolentes; sepala omnia pube cana crispa densa intus quoque induta; tori glandulae superiores ovatae, inferiores conformes, vix minores; stamina fere tota breviter hirsuta; germen (auctum) ex obovato cuneatum, pube brevi cana ad loculos densissima indutum nec non intus dense albido-pubescent, stylo glaberrimo; fructus—(non suppetebat).

Rami thyrsigeri diametro 2 mm. Folia inferiora 12 cm. longa, totidem lata; foliola terminalia 2-2.5 cm. longa, 0.9-1 cm. lata, lateralialia inferiora 1 cm. longa et lata; petiolus communis 2.5-3.5 cm. longus, partiales paullo breviores, rhacheum segmenta apicem versus decrescentia, summa circ. 1.2 cm. longa; stipulae minutae, subulatae. Thyrsi inferiores 35 cm., summi 7 cm. longi; cincinni stipite 5-6 mm. longo adjecto 1 cm. vix superantes, 5-6-flori; pedicelli 4-5 mm. longi, basi-articu-

lati; alabastra ellipsoidea, 3.5 mm. longa, albido-tomentella. Flores (masculi):—Sepala interiora 3.5 mm. longa. Petala 4.5 mm. longa, intus fere usque ad basin dense glanduligera; squamæ superiores crista obovata vix emarginata appendiceque deflexa brevi obtusa villosa, inferiores crista oblonga instructæ. Torus glaber. Stamina petala æquantia. Germinis rudimentum puberulum.

In Mexico: Palmer n. 795! (Agiabampo, 1890).

Obs. Maxime affinis *S. sphenocarpæ* Radlkofer (Sect. xi; cf. Radlk. *Serjaniæ* Monogr. p. 269), attamen robustior, ut videtur, et fructu obtuso (nisi maturitate formam variat) nec non epidermide valde mucigera (an satis?) distincta.

Serjania trifoliolata Radlkofer, sp. nov. Scandens, fruticosa, glabra; rami inæqualiter 6-costati, costis obtusis subfuscis, inter costas planiusculi vel leviter sulcati, sulcis viridibus; corpus lignosum simplex; folia ternata; foliola suborbicularia, mucronulata, in petiolulis abruptius attenuata, remote serrato-dentata, membranacea, glaberrima nec nisi glandulis microscopicis et subtus in axillis nervorum inferiorum pilorum fasciulo obsita, penninervia vel terminalia subtriplinervia, viridia, utrinque opaca, obsoletius pellucide punctata et lineolata, epidermide mucigera; petiolus communis nudus; thyrsi in ramulis accessoris supraaxillaribus paniculatim congesti, breviter pedunculati, ecirrhosi, adjecto interdum axillari longe pedunculato bicirrhoso; cincinni subsessiles, abbreviati; flores minimi, albi; sepala omnia glabriuscula, nec nisi margine apiceque minutissime puberuli, intus pube brevi induta; fructus sectionis xii. (semimaturus) oblongus, ad loculos trigonus, obtusus, glaber, loculorum pariete tenui (submembranacea), endocarpio glaberrimo; semen prope loculi basin insertum—(maturum non suppetebat).

Rami thyrsigeri diametro 2–3 mm. Folia circ. 12 cm. longa, 9 cm. lata; foliolum terminale petiolulo 1–1.5-centimetrali excluso circ. 5 cm. longum, 4.5 cm. latum, lateralia minora, brevius petiolulata; petiolus communis 5–6 cm. longus; stipule minute, ovato-triangulares. Thyrsi ecirrhosi circ. 4 cm. longi, bicirrhosi plus triplo longiores, rhachi pulverulento puberula, dense cincinnifera; pedicelli 1.5 mm., fructiferi 2 mm. longi, prope basin articulati; alabastra obovoidea, 1.5 mm. longa. Flores (masculi):—Sepala interiora 2 mm. vix superantia. Petala 2.5 mm. longa, intus glandulis paucis adspersa; squamæ (cristis exclusis) petala dimidia æquant, superiores crista profunde bifida, laciniis subulatis erectis, appendiceque deflexa brevi obtusa barbata, inferiores crista subcornuta erecta instructæ. Tori glandule superiores breviter ellipticæ, laterales obsoletæ. Stamina filamenta parce pilosula, antheræ glabræ. Germinis rudimentum glabrum. Fructus semimaturus 14 mm. longus, 6 mm. latus—(maturus non suppetebat).

In Mexico: Palmer n. 1367! (Manzanillo, ad flumen Cottone, m. Mart. 1891, flor. et fruct.).

Obs. Affinis *S. meridionali* (Sect. xii; cf. Radlk. *Serjaniæ* Monogr. p. 286), a qua præsertim foliis ternatis differt.

Serjania triquetra Radlk. Monogr. 305 (1875). Manzanillo, December 1 to 31, 1890. No. 972.

Paullinia fuscescens. H. B. K. Nov. Gen. et Spec. v. 120 (1821). Climbing shrub; flowers white; carpels "carmine color." Climbs over small trees and bushes. In the openings between the lagoon and the mountains. Manzanillo, March 2 to 18, 1891. No. 1400.

Paullinia sessiliflora Radlkofer, sp. nov. Scandens, fruticosa, pubescens vel subglabra; rami teretiusculi, leviter 4–5-sulcati, glabri; corpus lignosum simplex; folia 5-foliolata-pinnata; foliola ovali-oblonga, terminale basi cuneatum, lateralia apice basiue acutiuscula vel subobtusata, remote subrepando-dentata vel subintegerrima, margine revoluta, breviter petiolulata, chartacea, glabriuscula vel subtus pubi brevi densiore mollia nec non in axillis nervorum barbata, glandulis microscopicis obsita, subtus reti utriculorum laticiferorum pellucido

interrupto instructa, epidermide non mucigera; petiolus rhachisque late alata; thyrsi solitarii, pedunculati, elongati, interrupte cincinnigeri, tomentelli; cincinni sessiles vel breviter stipitati; bractee bracteolaeque lanceolato-subulatae, parvulae; flores sat magni, sessiles, ex albido flavescentes, sepalis tomentellis; fructus ex ellipsoideo pyriformis, glabratus, stipite quam capsula ipsa pluries brevior; semen ellipsoideum, compressiusculum, arillo dorso ventrequae fissio ultra duas tertias indutum.

Rami juniores (thyrsigeri) diametro 2-5 mm., adultiores lenticellis notati. Folia circ. 15 cm. longa, fere totidem lata, inferiora majora; foliola circ. 7 cm. longa, 2.5 cm. lata; petiolus communis 2-6 cm. longus, rhachis brevior vel aequilonga, alis basi vix angustatis utrinque 3-5 mm. latis; stipulae lineari-lanceolatae, 7-15 mm. longae, 2 mm. latae. Thyrsi 15-30 cm. longi, pedunculo 2-12 cm. longo, glabro; bractee circ. 2 mm. longae, 0.8 mm. latae. Sepala duo exteriora reliquis tertia parte breviora, interiora late ovata. Petala oblonga, circ. 5 mm. longa, 2 mm. lata; squamae duas petalorum tertias aequantes, margine villosae, superiores crista obcordata squamae dimidiam partem vix aequante appendiceque brevi barbata, inferiores crista aliformi fere recte adscendente instructae. Tori glandulae superiores orbiculares, conspicuae. Staminum filamenta filiformia, compressiuscula, pilosa; antherae glabrae. Germen e trigono globosum, tomentosum, stylo germen aequante. Fructus circ. 3 cm. longus, 1.6 cm. latus, stipite pilosiusculo 5 mm. longo, ruber. Semen 12 mm. longum, 8 mm. latum.

In Mexico: Palmer n. 1066! (Colima, m. Januario et Februario, 1891, flor., foliis subglabris); idem n. 1187! Manzanillo, m. Decembri, 1890, fruct.)

A Warwa (1868-71) in hortis insulae Hawaicae Honolulu lecta exstat in Hb. Vindobonensi, ut et *Paullinia tomentosa* Jacq.

Obs. Affinis *Paullinia clarigera* Schlecht. Linnaea X. 239 (1836) (Sect. i, *Neurotachus*; cf. Radlk. in Durand Ind. p. 72) a qua differt floribus majoribus sessilibus, capsula brevius stipitata, petiolis latius alatis.

Paullinia tomentosa Jacq. Enum. Pl. Carib. 37 (1760), fide Prof. Radlkofer. A shrub climbing over trees, with slender branches 10 to 20 feet long. Flowers white. Colima, January 9 to February 6, 1891. No. 1248.

Sapindus saponaria L. Sp. Pl. ed. 2. i. 526 (1762), fide Prof. Radlkofer. A small tree, 12 feet high, 3 to 5 inches in diameter, with a large compact top. In a creek bottom. Manzanillo, March 2 to 18, 1891. No. 1370.

Prof. Radlkofer writes me that it approaches the forms described as species under the names *S. inequalis* and *S. divaricatus*.

Matayba scrobiculata (H. B. K.) Radlk. Sitzungsber. K. Bayer. Akad. Bd. ix. 627 (1879); *Upania scrobiculata* H. B. K. Nov. Gen. et Spec. v. 127 (1821), fide Prof. Radlkofer. A tree 25 feet high with a compact top; leaves alternate, pinnate; leaflets 2 to 3 pairs, oblanceolate, cuneate at base, retuse, 3 to 5 inches long, glabrous above and beneath, strongly veined; panicle terminal and large; sepals 5, obtuse; petals 5; stamens 8, long exserted; ovary pubescent, 3-celled; style none. In woods about Manzanillo, March 2 to 18, 1891. No. 1339.

Dr. Palmer states that the flowers are of a greenish-yellow and sweet-scented.

ANACARDIACEÆ.

Veatchia discolor (Benth.) Brandegee, Proc. Cal. Acad. ser. 2. ii. 140 (1889); *Schinus* (?) *discolor* Benth. Bot. Voy. Sulph. 11, t. 9 (1844); *Rhus veatchiana* Kell. Proc. Cal. Acad. ii. 24 (1863); *Veatchia cedrosensis* Gray. Bull. Cal. Acad. i. 4 (1886); *Bursera pubescens* Watson. Proc. Amer. Acad. xxiv. 44 (1887). Dr. Palmer obtained flowering specimens of this at Angeles Bay in July, 1891. This is the same plant he collected here in 1887 (No. 585) which was only in foliage. It is called "Torate blanco." The bark is shipped to Europe and has valuable dye and tanning properties.

Spondias purpurea L. Sp. Pl. ed. 2. i. 613 (1762). Small tree, 8 to 15 feet high, sometimes 10 inches in diameter: flowers red. Manzanillo, December 1 to 31, 1891. No. 998.

Leaflets sometimes more numerous than described. Called "Ciruelo." The fruit is bitter, not edible; is said to be red when ripe.

Comocladia dentata Jacq. Enum. Pl. Carib. 12 (1760). Several stems, spreading from the base, 8 feet long: leaflets 6 to 7 pairs, oblong or the lower ones oval, obtuse, slightly and remotely toothed: sepals obtuse, pubescent: petals thin-nish. Manzanillo, March 2 to 18, 1891. No. 1393.

My specimens differ from the above species in having the sepals pubescent and petals thinner.

This species belongs to the West Indian Islands, and has not before been reported from Mexico; it is curious that it should now be obtained from western Mexico.

CORIARIACEÆ.

Rourea glabra H. B. K. Nov. Gen. et Spec. vii. 41 (1825). High climbing shrub. Only in fruit. Manzanillo, March 2 to 18, 1891. No. 1349.

LEGUMINOSÆ.

Crotalaria longirostrata Hook. & Arn. Bot. Beech. Voy. 285 (1836-'40). About 5 feet high, younger parts puberulent. Common in bottoms and on hills. Colima, January 9 to February 6, 1891. No. 1139.

Although I have not seen this species, yet this plant is probably rightly referred. Most of the upper leaflets are small (one-half inch long) as described, yet they are often $1\frac{1}{2}$ inches long. Dr. Palmer writes of it as follows: "One of the most attractive of plants. It is upright and with a compact symmetrical top. It is a free bloomer and the flowers are a beautiful yellow with brown patches, and it is worthy of cultivation."

In 1891 I sent seed to Kew where it was planted and proves to be a most promising plant. Sir Joseph Hooker has recently figured and redescribed it in Curtis's Botanical Magazine (vol. xlix. pl. 7306).

The following note is taken from the above article:

"A very handsome greenhouse plant described as suffruticose, but, though copiously branched, herbaceous as grown in the Royal Gardens, where it forms a conspicuous winter feature in the Begonia house, flowering freely from December to March and attaining a yard in height. It was discovered by the late Dr. Sinclair, surgeon in H. M. *Blossom*, during the surveying voyage of Capt. Beechey, at Acapulco on the west coast of Mexico, and also in the province of Jalisco by other officers of the ship, and on the Volcano de Fuego in Guatemala, altitude 5,300 feet, by Mr. Salvin, F. R. S., and at Mazatenango, by Bernoulli."

The Garden, in its issue of March 25, 1893, contains the following note respecting this plant:

"*Crotalaria longirostrata* may be seen in bloom in the stove at Kew. It is a thoroughly useful plant for flowering in the winter months, and the specimen there has kept up a gay display for over two months, notwithstanding the fogs, which are peculiarly trying to stove subjects. This species is still in full bloom, bearing at the ends of the long slender shoots clusters of large, bright yellow pea-shaped flowers, which make a great show of color in the winter season. It is easily propagated by cuttings, and all who wish for something distinct and attractive in their stoves during the so-called dark months of the year, should make good note of it."

Crotalaria sp. Manzanillo, December 1 to 31, 1890. No. 979; and Colima, January 9, to February 6, 1891. No. 1205.

Crotalaria sp. Manzanillo, December 1 to 31, 1890. No. 995.

Crotalaria sp. On level places about the lagoon. Manzanillo, December 1 to 31, 1890. No. 979.

Apoplanesia paniculata Presl, Sym. Bot. i. 64, t. 41 (1831). Diffuse shrub, 12 feet high, 3 inches in diameter, with a large top: flowers white. On the low land between the lagoon and the mountains. Manzanillo, December 1 to 31, 1890, No. 967. December 30, 1891. No. 1810.

A few specimens with leaves only were collected with *Coursetia glandulosa*. Manzanillo, March 2 to 18, 1890. No. 1373a.

This shrub is called by the Mexicans "Caenaquasle," and is used by them for covering their huts. The bark is said to yield a good dye.

This species is not in the National Herbarium, and has apparently been collected only once or twice.

Dalea diffusa Moric. Pl. Nov. Amer. 8, t. 6 (1833). Very common along ridges and river banks. Colima, January 9 to February 6, 1891. No. 1189.

This plant is largely sold in the market for brooms.

Dalea sp. Colima, February 27 and 28, 1891. No. 1312.

Dalea sp. Manzanillo, December 1 to 31, 1890. No. 933.

Indigofera sp. Manzanillo, December 1 to 31, 1890. No. 957.

Indigofera anil L. Mant. ii. 292 (1771). Manzanillo, December 1 to 31, 1890. No. 1057.

Tephrosia multifolia Rose, sp. nov. Somewhat bushy, several feet high, pubescent: leaves impari-pinnate; leaflets 10 to 15 pairs, narrowly oblong, 1 to 2 inches long, rounded at base, obtuse or retuse, appendiculate, green and appressed-pubescent above, paler and more pubescent beneath; stipules linear, caducous: racemes axillary or terminal, 4 to 8 inches long: pedicels 2 to 3 lines long: sepal triangular, acuminate, 2 lines long: corolla purplish; standard orbicular, 6 to 7 lines long; wings oblong: stamens 10, monadelphous above: style hairy: legume silky-pubescent, linear, 2 to 2½ inches long, about 10-seeded: seeds oblong, 2 lines broad, turgid.—Collected in a creek bottom. Manzanillo, March 2 to 18, 1891. No. 1364.

Seemingly near *T. schiedeana*.

Ghricidia maculata H.B.K. Nov. Gen. et Spec. vi. 393 (1823). A small tree, 15 to 25 feet high, 1 foot in diameter: flowers white in bud, but pink when expanded. Armeria, February 15, 1891. No. 1279.

Dr. Palmer says he saw this species at Colima also. It is a very profuse bloomer and the flowers last for two months. The leaves appear after the flowers are gone.

Diphysa sennoioides Benth. Kjoeb. Vidensk. Meddel. 1853, 12 (1854). Large shrub, 5 to 20 feet high, 4 inches in diameter, with spreading top; branches slender, often hanging: not seen in flower. Manzanillo, December 1 to 31, 1890. No. 890.

The pods are shorter than in Palmer's (1887) plant from Guaymas.

Diphysa racemosa Rose, Contr. Nat. Herb. i. 97 (1891). A shrub, 10 to 12 feet high: leaflets 1 inch long or less, obtuse: flowers yellow: banner with a brown spot. Colima, February 27 and 28, 1891. No. 1319. Certainly near this species but with large leaflets.

Coursetia glandulosa Gray, Proc. Amer. Acad. v. 156 (1862). Large diffuse shrub, 10 feet high. Manzanillo, March 2 to 18, 1891. No. 1373.

Coursetia mollis Robinson & Greenman, Proc. Amer. Acad. xxix. 384 (1894). Shrub (?), very pubescent, often glandular throughout: leaves oddly pinnate; leaflets 10 to 15 pairs, oblong, obtuse, 6 to 9 lines long, silky-pubescent on both sides; stipules stout spines 2 to 3 lines long: racemes axillary, single or in pairs, erect, many-flowered, 3 to 6 inches long: calyx campanulate; sepals 5, triangular, acuminate, the lower a little longer than the 2 upper, 3 lines long: flowers "light yellow" but drying purplish: vexillary stamen free, the other 9 connate into a tube, oblique: style inflexed, hairy: legume 2½ to 3 inches long, pubes-

cent, linear, 2-valved, many-seeded. Very common along hillsides. Colima, January 9 to February 6, 1891. No. 1141.

Cracca edwardsii Gray, Pl. Wright. ii. 35 (1853). Stems 2 to 3 feet high. Along creek bottoms. Agiabampo, October 3 to 15, 1890. No. 787.

Stems about 2 feet high. Grows in shady places on the mountain side, only 2 plants seen. Manzanillo, December 1 to 31, 1890. No. 955.

Sesbania macrocarpa picta (Cav.) Watson, Proc. Amer. Acad. xxiv. 46 (1889); *Eschynomene picta* Cav. Ic. iv. 7, t. 314 (1797). Stems 5 to 6 feet high. Common in rich bottom near Agiabampo, October 3 to 15, 1890. No. 775.

Æschynomene americana L. Sp. Pl. ii. 713 (1753). Colima, January 9 to February 6, 1891. No. 1102. This seems to be the most common Mexican form.

Also a somewhat similar species, but perhaps distinct, growing in the wet bottoms about the bay at Manzanillo, December 1 to 31, 1891. No. 901. The flowers are white, legume glabrous and there are slight differences in the parts of the corolla.

Æschynomene amorphoides (Watson) Rose in Robinson, Proc. Amer. Acad. xxix. 315 (1894); *Brya* (?) *amorphoides* Watson, Proc. Amer. Acad. xxii. 406 (1887). An upright shrub with many lateral branches: leaflets 25 to 40 pairs, often 4 to 5 lines long; stipules ovate-acuminate, early deciduous: the bractlets subtending the flowers small, $\frac{1}{2}$ line long, oval, 5-nerved; calyx 1 line long;* teeth 5, small, the lower a little narrower and longer; staminal tube cleft above and below into 2 equal phalanges: legume 1- to 3-jointed; joints broadly falcate, glabrous, or nearly so. Growing in stony places in various parts of the mountains. Manzanillo, December 1 to 31, 1890. No. 903.

This species was doubtfully referred to *Brya* by Dr. Watson in the Proc. Amer. Acad. xxii. 406. The material from which his description was drawn was only in flower, although specimens in the National Herbarium of the same distribution (Palmer's 1886) have nearly mature legumes. In the above description I have added some additional characters not found in the original. This species seems to belong very clearly to *Æschynomene* rather than to *Brya*. Dr. B. L. Robinson has independently reached the same conclusion. *Æschynomene* differs from the latter in having the staminal tube cleft below as well as above, the bractlets appressed to the calyx, leaflets more numerous and appendiculate, stipules not spinescent, and joints often more than 2. In all the above points my specimens agree with *Æschynomene*. *Brya* also has large yellow flowers. Two of the three species of *Brya* have single leaflets and in *B. eberus* the leaflets are evergreen.

Æschynomene fascicularis Cham. & Schlecht. Linnaea, v. 584 (1830). Stems 2 to 3 feet high: flowers yellow. Agiabampo, October 3 to 15, 1890. No. 808.

Æschynomene hispida Willd. Sp. Pl. iii. pt. 2. 1163 (1801). A single specimen collected with *Sesbania macrocarpa picta*. Agiabampo, October 3 to 15, 1890. No. 775a.

Æschynomene petraea Robinson, Proc. Amer. Acad. xxvii. 166 (1892). Along river bank near Colima, January 9 to February 6, 1891. No. 1153.

I first described this plant as a new species, but owing to the long delay in the publication of my paper it has since been named as above. I have not yet seen the type, but Dr. B. L. Robinson assures me that it is his species.

Also collected by Marcus E. Jones, at Tuzpan, Jalisco, June 15, 1892 (No. 597), and at Chiquilistan, May 30, 1892 (No. 718).

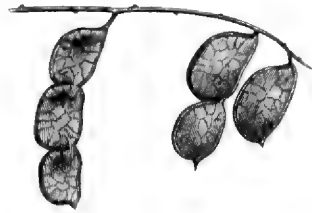


FIG. 4.—Three legumes from *Æschynomene amorphoides*; natural size.

* In the original description said to be 6 lines long, which is evidently a mistake.

Desmodium scorpiurus (Swartz) Desv. Journ. Bot. Ser. 2. i. 122 (1813); *Hedysarum scorpinus* Swartz, Prod. Veg. Ind. Occ. 107 (1788). A very variable species as to the leaves. The form found at Colima has the typical oblong leaflets, but the specimens from Armeria have linear leaflets. Colima, January 9 to February 6, 1891, No. 1101; also February 27, 1891, No. 1101a. The specimens collected at Armeria were obtained on the dry table-lands. February 15, 1891. No. 1276.

Desmodium triflorum (L.) DC. Prod. ii. 334 (1825); *Hedysarum triflorum* L. Sp. Pl. ii. 749 (1753). A prostrate herb. In shade along a creek bottom. Colima, January 9 to February 6, 1891. No. 1128.

Desmodium sp. A small plant growing in the shade. Colima, January 9 to February 6, 1891. No. 1103.

We have nothing in the National Herbarium to match this plant.

Desmodium sp. Two specimens just past flowering. In wet ground. Manzanillo, December 1 to 31, 1890. No. 928.

Erythrina coralloides DC. Prod. ii. 413 (1825). A small tree, 10 feet high. Agiabampo, October 3 to 15, 1890. No. 771.

Commonly called "Pioneo." The seeds are pulverized and used in making a kind of poultice.

Calopogonium cæruleum (Benth.) Hemsl. Biol. Cent.-Amer. i. 301 (1880); *Stenobolium cæruleum* Benth. Ann. Wien. Mus. ii. 125 (1837). A high climber. Common along watercourses. Colima, January 9 to February 6, 1891. No. 1108.

Canavalia obtusifolia (Lam.) DC. Prod. ii. 404 (1825); *Dolichos obtusifolia* Lam. Encyc. ii. 295 (1786). Growing very abundantly in the sand along the seacoast. Manzanillo, December 1 to 31, 1890. No. 1024.

Only the pods were obtained.

Canavalia acuminata Rose, sp. nov. A climbing shrub, glabrous or early glabrate: leaflets 3, oblique-oval or -ovate, rounded at base, acuminate but tip truncate or appendiculate, glabrous on both sides, 2 to 4 inches long: racemes axillary, nodose, 3 to 7 inches long: flowers large: calyx tube 5 to 6 lines long, with very short lobes; upper lobe 2-parted, very large, rounded; lower lobe 3-parted, minute: corolla large; banner orbicular, obtuse, with short claw, 12 to 14 lines long, yellow; wings linear, 10 lines long including the claw (2 to 3 lines long); keel oblique-oblong, 14 lines long, "cream color," slightly twisted at the tip: ovary and young legumes silvery-pubescent: mature legumes straight, oblong, 6 to 8 inches long, strongly 2-ribbed on side of each valve: seeds brownish-black, oval, 6 lines in diameter.—In various parts of the mountains about Manzanillo, December 1 to 31, 1890. No. 1036.

This plant climbs over the highest bushes. The buds are said to be steel-colored.

Phaseolus (Drepanospron) sp. Colima, January 9 to February 6, 1891. No. 1116.

Phaseolus (?) sp. Only a single specimen collected and this in fruit. Manzanillo, March 2 to 18, 1891. No. 1365.

Phaseolus (?) sp. Manzanillo, December 1 to 31, 1890. No. 904.

Rhynchosia phaseoloides (Swartz) DC. Prod. ii. 385 (1825); *Glycine phaseoloides* Swartz, Prod. Veg. Ind. Occ. 105 (1788). Colima, January 9 to February 6, 1891. No. 1216.

Rhynchosia minima (L.) DC. Prod. ii. 385 (1825); *Dolichos minimus* L. Sp. Pl. ii. 726 (1753). Common in rich bottom lands. Agiabampo, October 3 to 15, 1890. No. 789.

Lonchocarpus (Neuroscapha) palmeri Rose, sp. nov. A tree 20 to 30 feet high, 6 to 12 inches in diameter: leaves large, alternate, with 7 to 13 leaflets; leaflets opposite, oval or oblong, rounded at base, rarely cuneate, obtuse or sometimes acuminate, shining and a little pubescent above, soft-pubescent and strongly veined beneath, 2 to 5 inches long: lower pedicels 2-flowered; bracts oval, obtuse, deciduous: calyx $1\frac{1}{2}$ lines long, cup-shaped, truncate or with small teeth:

corolla 6 lines long; the standard greenish-yellow, densely silvery-pubescent, as broad as long, retuse, and with callous appendages; wings and keel "light mauve" or purplish, somewhat pubescent, slightly adhering (as in this genus), each on a claw $2\frac{1}{2}$ lines long; ovary and legume pubescent: legume 2 to 3 inches long, several seeded, somewhat thickened on the ventral side by a ridge on each side near the margin: seeds brown, kidney-shaped, 4 lines broad.—Manzanillo, December 1 to 31, 1890. No. 1021.

This tree has a large spreading top; its numerous clusters of flowers are very attractive.

This species seems nearest *L. sericeus*, but differs in its larger obtuse and strongly veined leaves, longer raceme and larger flowers.

Lonchocarpus (?) sp. A small tree, 15 feet high, 8 inches in diameter, with large spreading top: leaflets 9 to 13, oblong or oval, 1 to 2 inches long, obtuse, glabrous and shining above, rusty-pubescent beneath, with veins impressed above, strongly elevated beneath: racemes 3 to 6 inches long: legumes densely brownish-tomentose, elliptical or rarely oblong, slightly tapering at the base, $2\frac{1}{2}$ to 3 inches (rarely 4 inches) long, indehiscent, 1- (rarely 2-) seeded. At the base of the mountains. Manzanillo, December 1 to 31, 1890. No. 984.

The seeds are sometimes eaten by birds, but with poisonous effects.

This species certainly comes near *L. rugosus* and answers Benthau's description very well except in the pods. In the absence of flowers, therefore, I have referred it without specific name.

Lonchocarpus sp. A diffuse shrub, 6 to 8 feet high: leaves small, alternate, with 5 to 7 leaflets; leaflets opposite, oval, obtuse or retuse, thin, 6 to 15 lines long, glabrous above, villous-pubescent beneath: racemes 2 to 3 inches long: calyx cup-shaped, truncate, brownish-pubescent, 1 line long: corolla purplish; banner broader than long, 4 lines long, 5 lines broad, retuse: style glabrous: ovary pubescent: legume not seen. In rocky places near the base of the mountains. Manzanillo, March 2 to 18, 1891. No. 1379.

Swartzia grandiflora Willd. Sp. Pl. ii. 1220 (1799). A small tree, 15 feet high and about 3 inches in diameter. A single tree seen along the trail near the base of the mountains. Manzanillo, December 1 to 31, 1890. No. 1005.

Cæsalpinia bonducella (L.) Fleming, in As. Res. xi. 159 (1810); *Guilandina bonducella* L. Sp. Pl. ed. 2. i. 545 (1762). Three to four feet high. Only along the sandy beach just above high tide. Manzanillo, December 1 to 31, 1890. No. 1015.

Cæsalpinia cacalaco Humb. & Bonp. Pl. Æq. ii. 173 [Fr. ed. 165], t. 137 (1809). A shrub 6 feet high. Only a single plant found in the low lands near the lagoon. Manzanillo, December 1 to 31, 1890. No. 997.

The lower sepal has a lacerate margin, and in this differs from Humboldt and Bonpland's figure.

Cæsalpinia eriostachys Benth. Bot. Voy. Sulph. 88 (1844). A small tree, 15 to 20 feet high, 8 inches in diameter, with large symmetrical top: leaves 4 to 6 inches long with small glabrous leaflets: racemes often 9 inches long: legumes glabrous, 3 to 9 inches long, 9 to 10 lines broad, falcate or straight, sharply pointed, tardily dehiscent. Colima, February 27, 1891. No. 1309. Manzanillo, March 2 to 18, 1891. Letter E.

This plant is called "Palo alejo." The bark is used by fishermen, who crush it and throw it into the water to stun fish.

Apparently very common on mountain sides both at Colima and Manzanillo. Its published range is now extended much farther northward. According to Mr. Hemsley it has been collected three or four times before, but not north of the Central American States.

Mr. Bentham did not have mature legumes for his description, and hence I have carefully characterized them above, as well as filled in some dimensions

not given before, and added some variations not found in the original description. This species is very different from our other Mexican specimens in its oblique leaflets and glandular stamens.

Cæsalpinia (Coulteria) platyloba Watson, Proc. Amer. Acad. xxi. 425 (1886). A shrub, 8 feet high, glabrous: leaves twice pinnate; pinnae 2 to 4 pairs; leaflets 6 to 9 pairs, oblong, acute, 1 to 2 inches long, glabrous: racemes axillary, 3 to 4 inches long: lower sepal pectinate-fimbriate: petals yellow: stamens hairy at base, about the length of the petals: pods indehiscent, glabrous, 3 to 6 inches long, 10 to 15 lines broad. Along the sandy beach a few feet above tide water. Manzanillo, December 1 to 31, 1890. No. 1010 (in fruit); March 2 to 18, 1891. Letter K (in flower).

This seems to be the plant that Dr. Watson referred as above while questioning its generic position. My plant differs in several minor details, and especially in the length of the pods. Flowering specimens are now for the first time collected and show clearly that the plant belongs to this genus and to the section *Coulteria*. The specimens ought to be compared with the South American species *C. tinctoria*, to which it is certainly closely related. Here, perhaps, may be referred Coulter's No. 873 from Zimipán, cited by Mr. Hemsley in Biol. Cent.-Amer. vol. i.

Cæsalpinia (Pomaria) sp. Shrub, 15 feet high, loosely branching: leaves 2-pinnate; pinnae 2 to 4 pairs; leaflets, 2 to 3 pairs, oblong or oval, obtuse, unequal at base, glabrous, strongly veined, 6 to 18 lines long: racemes terminal and axillary, 5 to 10 inches long; pedicels 4 to 5 lines long: sepals 5, puberulent, strongly imbricated, obtuse, 4 about equal, the fifth exterior and longer: petals 5, yellow, covered more or less with short stipitate glands, 4 to 5 lines long: stamens 10, woolly at base, a little longer than the corolla: legume falcate, narrowed downward, 2 inches long, densely covered with stipitate glands, 3- to 4-seeded: seed 4 lines broad. Manzanillo, March 2 to 18, 1891. No. 1397.

This species resembles *C. palmeri* in its legumes, but in foliage approaches *C. mexicana*.

Dr. Palmer also collected a form closely related to this from Colima, but with larger, straight pods, less tapering at base, leaflets smaller and often 4 pairs, etc. Letter F.

Cæsalpinia* sp. A large bush on hills and in bottoms. Agiabampo, October 3 to 18, 1890. No. 796.

Probably *C. platyloba*, but not collected in flower; the few pods are immature.

Cæsalpinia (Libidibia) sp. Small tree, 15 to 20 feet high: leaves 2-pinnate; pinnae 4 to 6 pairs; leaflets 3 to 5 pairs, glabrous, oval to obovate, obtuse or retuse, 9 to 18 lines long: raceme terminal, 6 to 12 inches long, puberulent (as also the young branches and rachis of the leaves), many-flowered: sepals 5, obtuse and with entire margins; the lower sepals larger, exterior and strongly concave: petals 5, "outer ones yellow, inner ones red," 4 about equal, oblong, 5 lines long; upper one smaller, orbicular: stamens about the length of the petals, very woolly: ovary silky-pubescent: legumes slender, 4 to 7 inches long, torulose, indehiscent, many-seeded. Armeria, February 15, 1891. No. 1289.

A handsome tree, 6 inches in diameter at base, with large symmetrical top. Called "Palo fierro."

This species is very near *C. cacalaco*, and I see no good reason for keeping it separate. I have not seen any specimens, however, of that species, and there-

* *Cæsalpinia mexicana* Gray. This is a small bush common about Monterey. Specimens were collected and sent in by Charles K. Dodge, April, 1891; also collected by Eaton and Edwards from the same locality many years before.

Cæsalpinia pulcherrima Swartz. Collected at Vera Cruz, April 12, 1888, by James Shepard.

fore leave my specimens undetermined. My specimens have no thorns on the branches, but this is likewise true of Humboldt and Bonpland's figure.

Cassia atomaria L. Mant. i. 68 (1767). A small tree, 15 feet high, 4 inches in diameter: leaflets 3 to 6 pairs, often 5 inches long: raceme slender, hanging, 12 to 15 inches long: legumes often 16 inches long. On the mountains around Manzanillo, December 1 to 31, 1890. No. 983.

This plant is referred as above, although I have not otherwise seen *C. atomaria*. The leaflets are somewhat larger than described, but I have little hesitation in referring it here.

Cassia biflora L. Sp. Pl. i. 378 (1753). Manzanillo, March 2 to 18, 1891. No. 1350.

Cassia manzanilloana Rose, sp. nov. A large diffuse shrub, 5 feet high, puberulent: leaflets 4 pairs, 1 inch or less long, obovate, obtuse, paler beneath, bearing a gland between the lower pair: flowers in axillary racemes: sepals unequal: 3 stamens long, curved, rostrate; 4 shorter, straight; 3 sterile, small, deltoid, petaloid: legumes 3 to 6 inches long, terete, 7 to 8 lines in diameter; endocarp becoming fleshy, separating from the exocarp: seeds appearing in 2 rows, horizontal.—Low land along streams. Colima, January 9 to February 6, 1891. No. 1161.

A single shrub 4 feet high, in flower, was found at Manzanillo, on the banks of the river. December 1 to 31, 1891. No. 1061.

This species belongs in Benthham's section *Chamaefistula*. It resembles considerably *C. bicapsularis*, but differs in being puberulent, the longer stamens rostrate, etc.

Cassia oxyphylla Kunth, Mimos. 129, t. 39 (1819). In a swamp. Manzanillo, December 1 to 31, 1891. No. 1052. Armeria, February 15, 1891. Letter L.

Cassia rotundifolia Pers. Syn. i. 456 (1805). Grassy mesa near the city of Colima, January 9 to February 6, 1891. No. 1107.

Cassia sericea Swartz, Fl. Ind. Occ. 724 (1800). Stems 2 to 4 feet high. Common on the low land at base of mountains, and about the lagoon. Manzanillo, December 1 to 31, 1890. No. 906.

This plant is called "Bicho."

Bauhinia porrecta Swartz, Prod. Veg. Ind. Occ. 66 (1788). A diffuse shrub, 12 feet high, flowers white. Only two plants seen growing in shady woods. Armeria, February 15, 1891. No. 1284.

This species agrees with C. Wright's specimen collected in 1853-56 in Nicaragua. In both of these specimens, however, the leaves are truncate or rounded at base and more acute than in the figure (No. 1708) of Curtis's Botanical Magazine.

Bauhinia (Casparia) sp. Shrub, 15 feet high: Leaves glabrous above, pubescent beneath, truncate or a little cordate at base, deeply emarginate, 7-nerved: petals white, on long pubescent claws: stamens 10, 1 fertile, 9 connate and sterile: ovary pubescent: legume puberulent. Colima, February 27 and 28, 1891. No. 1322.

Entada polystachya DC. Mem. Leg. 434, tt. 61, 62 (1825). A high climbing shrub: leaves twice pinnate: leaflets 6 pairs, oblong, rounded at apex, somewhat oblique at base, glabrous: pods a foot long, $2\frac{1}{2}$ inches broad, glabrous. Manzanillo, December 1 to 31, 1890. No. 988.

If this reference, made without having seen the species, is correct, it extends the range of this plant considerably northward. Mr. Hemsley gives only three stations for North America and all those in Central America.

Piptadenia leptocarpa Rose, sp. nov. Large diffuse shrub, about 16 feet high, glabrous or nearly so, with numerous reflexed prickles: leaves large; rachis some-

*Through the kindness of Capt. John Donnell Smith, I have been able to see and study this species as represented by Eggers's West Indian plant. The two plants are undoubtedly the same.

what prickly; pinnae 10 to 12 pairs; leaflets about 30 pairs, linear 3 to 5 line long, glabrous or nearly so; the midrib on one side: spikes mostly paired in the axils of the leaves, 3 to 4 inches long, densely flowered: flowers yellow, subtended by a small, oval, deciduous bract: calyx nearly truncate, $\frac{1}{2}$ line long: petals 5, a line long: stamens as in the genus, 10; anthers glandular: ovary glabrous: legume 3 to 5 inches long, 9 lines broad, glabrous, thin, the two valves readily separating when mature: seeds containing albumen.—In various parts of the mountains back from Manzanillo. December 1 to 31, 1890. No. 996.

This species belongs to Bentham's *Eupiptadenia*, and is nearest *P. communis* of South America, but more thorny, with more numerous pinnae, shorter pods, etc. It differs from the other species of this genus in having albumen in the seed.

Prosopis juliflora (Swartz) DC. Prod. ii. 447 (1825); *Mimosa juliflora* Swartz, Prod. Veg. Ind. Occ. 85 (1788). A low-spreading shrub, growing at the base of the mountains and about the lagoon. Manzanillo, December 1 to 31, 1890. No. 985.

This plant is called here "Algarroba."

Mimosa asperata L. Sp. Pl. ed. 2. ii. 1507 (1763). Shrub 4 to 5 feet high: leaves very sensitive. Growing in the water near where a creek empties into the lagoon. Manzanillo, March 2 to 18, 1891. No. 1377.

Mimosa distachya (?) Cav. Ic. iii. 48, t. 295 (1794). A small tree, 15 feet high, with large top: leaves with 2 pinnae; leaflets 3 pairs: pods $1\frac{1}{2}$ inches long, strongly setose. In grassy plains. Armeria, February 15, 1891. No. 1291.

This species could only be collected in poor condition, and only a few leaves and no flowers were obtained. It is referred here, owing to its close resemblance, to *M. laxiflora*, from which, however, it differs very much in its pods.

The fruit was not known by Mr. Bentham when he wrote his monograph in Trans. Linn. Soc., and I do not know whether it has ever before been collected.

Mimosa (Sensitiva) manzanilloana Rose, sp. nov. Thorny shrub, 5 feet high, with slender hanging branches, glabrous: leaves twice pinnate; leaflets two pairs (one of the lower leaflets very small or often wanting), 9 to 15 lines long, oblong, acute, glabrous except for the appressed setae of the margins and under surface: inflorescence in raceme-like clusters of heads, or the lower peduncles subtended by leaves: flowers pink: stamens 4 or 5: legumes 1 inch or more long, puberulent, the margins and sides with few appressed setae.—Low places near base of the mountains. Manzanillo, December 1 to 31, 1890. No. 905.

The leaves are said to be somewhat sensitive. It is nearest *M. vellosiana*, but with smaller heads, different pod, etc.

Mimosa leptocarpa Rose, sp. nov. A large shrub, with many long, slender, hanging branches: young branches and rachis of leaves with many small reflexed prickles: pinnae 4 to 6 pairs; leaflets 6 to 12 pairs, oblong, 3 to 6 lines long, obtuse, appendiculate, puberulent: flowers capitate, racemose; peduncles 6 lines long: flowers wanting: stamens 5: legumes flat, thin, glabrous, shining, oblong, 3 to 5 inches long, 8 to 10 lines broad; valves not articulated; replum delicate, often bearing



FIG. 5.—Two pods of *Schrankia diffusa*, one of them dehiscent, showing valves, replum, etc.; natural size.

reflexed prickles; stipe 3 to 6 lines long.—Manzanillo, March 2 to 18, 1891. No. 1311.

Schrankia diffusa Rose, sp. nov. A weak plant, with long hanging branches 4 to 6 feet long, with short pubescence and reflexed prickles; leaves sensitive, with 2 to 3 pairs of pinnae; rachis prickly and pubescent; stipules setaceous; leaflets 10 to 20 pairs, glabrate, linear-oblong, 4 to 5 lines long; peduncles becoming 10 lines long; flowers capitate, pink becoming white; sepals valvate; stamens 10; legume terete, 2 to 4 inches long, more or less beaked, naked or a little prickly.—Very common along the beach, hanging over rocks and low bushes. Manzanillo, December 1 to 31, 1891. No. 1046.

Nearest *S. subinermis*, but with more pinnae and leaflets, longer legumes, etc.

Leucæna macrophylla Benth. Bot. Voy. Sulph. 90 (1844). A small tree, 12 feet high; peduncle 3 to 6 lines long; pods 8 to 10 inches long, 12 to 15 lines broad on stipes 1 inch long. Along a river bank. Colima, February 27 and 28, 1891, No. 1325.

The specimen is only in fruit.

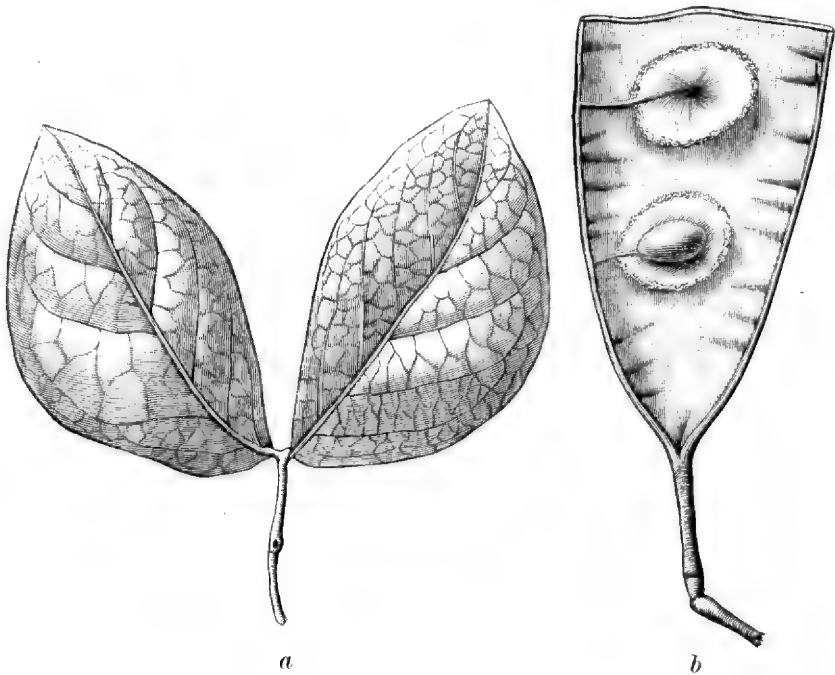


FIG. 6.—*Leucæna macrocarpa*; a, the terminal pair of leaflets; b, a section of the legume.

This is a rare species and has been poorly understood in this country. This confusion has been due to two factors: First, the absence of the species from all our collections, and, second, because Mr. Bentham referred to it (Trans. Linn. Soc. xxx.) an undescribed species, which proves to be a species of *Albizzia*. I should state here that it is through the kindness of Mr. Hemsley, of Kew, that I have been able to clearly fix upon this as the true *L. macrophylla*.

The pods described above were detached, and while a little longer than the type seem to be the same. They may, however, as suggested by Mr. Hemsley, belong to a different species.

Leucæna macrocarpa Rose, sp. nov. A shrub or small tree, 25 feet high or less, glabrous; leaves twice pinnate; pinnae 2 to 4 pairs; leaflets large, 2 to 3 pairs, $1\frac{1}{2}$

to 3 inches long, oblong or oval, somewhat oblique, acute, rounded at base, strongly reticulated, a little puberulent beneath: flowers in small, compact heads in terminal naked racemes: legume large, 8 to 10 inches long, 1 to 1½ inches broad; stipes 9 to 12 lines long. This is *L. macrophylla*, Watson Proc. Amer. Acad. xxii. 409, collected by Palmer at Rio Blanco, State of Jalisco, August 1886 (No. 320). The flowering specimens of No. 320 are made the type of this species. Here undoubtedly belongs Pringle's No. 3848, from the same State, collected in 1891 and distributed under *L. macrophylla*, but the name is corrected in Mr. Pringle's list for 1892. Palmer's No. 981 from Manzanillo (December 1 to 31, 1891) is also referred here, but with less confidence. The specimens are only in fruit and the foliage and legumes are so similar to Mr. Brandegee's *Albizia occidentalis* that without flowers it is next to impossible to separate the two. Palmer's Jalisco plant, which is undoubtedly a true *Leucana*, has pods exactly like those from Manzanillo.

Mr. Hemsley has compared these specimens with the type at Kew and decided that it is not the *L. macrophylla* of Bentham. The leaves are in fact much larger than in that species.

Acacia cochliacantha Humb. & Bonp. in Willd. Sp. Pl. iv. 1081 (1805). Sometimes a tree 30 feet high. Manzanillo, March 2 to 18, 1891. Nos. 1353, 1331.

Xantus found it here in 1859 and '60.

Acacia coulteri Benth. in Gray, Pl. Wright. i. 66 (1852). A handsome tree, 20 feet high, 3 to 5 inches in diameter: leaves large, often with 25 pairs of pinnae: spikes 4 to 5 inches long, in pairs, often forming terminal racemes 10 inches long: flowers sweet-scented: legume with thin valves covered with a close tomentum. Along river bottoms and mountain sides. Colima, January 9 to February 6, 1891. No. 1209.

I have seen flowering specimens only of *A. coulteri*, with which the above compares fairly well. Bentham's description, however, calls for fewer pinnae, shorter stipes, and glabrous pods.

Acacia spadicigera Cham. & Schlecht. Linnaea, v. 594 (1830). A large tree, a foot in diameter: flowers sweet-scented. Manzanillo, March 2 to 18, 1891. No. 1395.

This is one of the Acacias in which the tree-inhabiting ants live. They nest in the large stipular spines, each pair being inhabited by a colony.

Acacia willardiana Rose, Contr. Nat. Herb. i. 88 (1890); *Prosopis heterophylla* Benth. in Lond. Journ. Bot. v. 82 (1846).

Dr. Palmer has re-collected an abundance of these plants in flower and fruit. Seed has been distributed, and it is hoped that the species will prove valuable in cultivation. Guaymas, April 1 to 2 (in flower) and July, 1891 (in fruit). No. 164a and 164b.

Mr. Brandegee has recently sent me specimens collected at Guaymas, May 12, and at Hermosillo, May 22, 1892.

Acacia sp. Large tree, 30 feet high, 1 foot in diameter. Near the base of the mountains. Manzanillo, March 2 to 18, 1891. No. 1401.

This species is only in fruit. It is near *A. cochliacantha*.

Calliandra coulteri Watson, Proc. Amer. Acad. xvii. 352 (1882). Six to eight feet high. Manzanillo, December 1 to 31, 1890. No. 896.

Calliandra grandiflora (L'Her.) Benth. in Hook. Journ. Bot. ii. 139 (1840); *Mimosa grandiflora* L'Her. Sert. Angl. 30 (1788). Shrub, 8 to 10 feet high. Along river banks. Colima, January 9 to February 6, 1891. No. 1200.

Pithecolobium dulce (Roxb.) Benth. in Hook. Lond. Journ. Bot. iii. 199 (1844); *Mimosa dulcis* Roxb. Corom. Pl. i. 67 t. 99 (1795). Manzanillo, December 1 to 31, 1890, No. 966; also, Agiabampo, October 3 to 15, 1890. No. 800.

Pithecolobium tortum Mart. Herb. Fl. Bras. 114 (1837). A diffuse shrub, 8 to 10 feet high: rachis 2 to 3 inches long, bearing a small gland half way between the base and first pair of pinnae, and generally between the uppermost pair:

pinna 3 pairs; leaflets 5 to 7 pairs, oval, obtuse, glabrous, 3 to 4 lines long: pods linear, 6 to 9 inches long. At the base of the mountain. Manzanillo, December 1 to 31, 1890. No. 916.

Pithecolobium (?) sp. Small tree, 15 to 20 feet high. Not in flower. Armeria, February 15, 1891. No. 1283.

The fruit is used in tanning, especially the hides of small animals. It is known as "Cascalote."

COMBRETACEÆ.

Combretum farinosum H. B. K. Nov. Gen. et Spec. vi. 110 (1823). One of the highest climbers of the region. Collected both in flower and fruit. Manzanillo, December 1 to 31, 1891. No. 1067.

Combretum mexicanum* Humb. & Bonp. Pl. Æq. ii. 159 [Fr. ed. 151], t. 132 (1809). Large shrub with long weak branches: leaves broadly oblong to oblanceolate, rounded at base, "dark olive colored," petals yellowish: flowers "sweet-scented." At the base of the mountains near Manzanillo, March 2 to 18, 1891. No. 1374.

I have not been able to compare this with authentically named specimens, but it answers fairly well for the above species. The leaves are very similar to *C. jacquini* Griesb (?), but this species is said to be climbing.

MELASTOMACEÆ.

Tibouchina schiedeana Cogn. in DC. Monogr. Phan. vii. 261 (1891), *vide* Cogniaux. About 2 feet high. On the bank of a river. Colima, January 9 to February 6, 1891. No. 1238.

Conostegia xalapensis Don, Mem. Wern. Soc. iv. 317 (1823). A small tree about 15 feet high. On lowlands about Colima, January 9 to February 6, 1891. No. 1125.

LYTHRACEÆ.

Cuphea llavea Lex. in La Llave & Lex. Nov. Veg. Desc. fasc. i. 20 (1824). Not common. Colima, January 9 to February 6, 1891. No. 1224.

Cuphea sp., Colima, February 27, 1891. No. 1296.

Cuphea sp., Colima, January 5 to February 6, 1891. No. 1221.

Lawsonia inermis L. Sp. Pl. i. 349 (1753). Cultivated in gardens. Colima, January 9 to February 6, 1890. No. 1212.

ONAGRACEÆ.

Jussieuia octonervia Lam. Encyc. iii. 332 (1789). A small plant, 1½ to 2 feet high. In wet places. Colima, January 9 to February 6, 1891. No. 1217.

Also grown in 1892 by Mrs. Wolcott from seed obtained by Dr. Palmer.

This species is not reported in Biol. Cent.-Amer., but it was obtained by Palmer at Guaymas, 1887 (Watson in Proc. Amer. Acad. xxix. 49), and by W. G. Wright, at Mazatlan, in 1889. We also have specimens collected in Florida and Texas.

SAMYDACEÆ.

Casearia corymbosa H. B. K. Nov. Gen. et Spec. v. 366 (1821). Colima, February 27 and 28, 1891. No. 1317.

Dr. Palmer says, "the plant is loaded with white flowers and with new leaves and shoots, which are very full of moisture, making them very difficult to dry."

* *Combretum reticulatum*, which is an Abyssinian species, is credited to Mexico by Walper (Repert. ii. 65), and this is followed by Mr. Hemsley (Biol. Cent.-Amer. i. 404), while *C. tetragonum* Presl, was evidently intended.

This species may not be properly referred, but it is certainly near Dr. Palmer's Jalisco plant named *C. corymbosa* by Dr. Watson. The stamens in my flower are 8.

Casearia sp. Diffuse shrub, 6 to 8 feet high: young branches yellowish pubescent: leaves deciduous, alternate, oblanceolate, downy-pubescent, sharply serrate: flowers axillary, large: calyx 5-lobed, pubescent without: stamens 10, ovary 1-celled, with 3 parietal placentæ: style entire. Manzanillo, December 30, 1891. No. 1812.

I have not been able to place this in any described species, and, owing to the present confusion in the genus, I have deemed it best not to give it a specific name.

Mr. Marcus E. Jones has collected what seems to be the same species at Colima (No. 72), July 2, 1892.

TURNERACEÆ.

Turnera diffusa aphrodisiaca (Ward) Urban, Jahrb. Bot. Gard. Berl. ii. 127 (1883); *T. aphrodisiaca* Ward, Va. Med. Month. iii. 48 (1876). Manzanillo, December 1 to 31, 1890. No. 1071.

CUCURBITACEÆ.

Momordica charantia L. Sp. Pl. ii. 1009 (1753). Climber running over bushes. At the foot of the mountains near Manzanillo, December 1 to 31, 1890. No. 1016.

The fruit is eaten by children and birds.

Palmer's No. 59 from La Paz (poor specimens only were obtained) was referred to the above species, p. 70 of this volume, but is probably *M. balsamina*.

Cucurbita radicans. Naud. Ann. Sci. Nat. ser. 5. vi. 8 (1866), *fide* Cogniaux. Manzanillo, December 1 to 31, 1891. No. 1037.

Luffa operculata intermedia Cogn. var. nov. Petiolus $\frac{1}{2}$ –1 decim. longus. Folia profunde lobata, lobes lobulatis. Cirrhi sepius trifidi. Flores feminei breviter pedunculati.—A climber running over fences and bushes. Very common in creek bottoms. Agiabampo, October 3 to 15, 1890. No. 770.

Also found growing about the lagoons at Manzanillo, December 1 to 31, 1890. No. 1018.

Corallocarpus emetocatharticus (Grosourdy) Cogn. Bull. Soc. Bot. Belg. xxx. pt. 1. 279 (1891); *Doyerea emetocathartica* Grosourdy, El Médico Bot. criollo, ii. 388 (1864), *fide* Cogniaux. A vine climbing over small bushes: leaves ovate, somewhat 3-lobed, glabrous or nearly so above, with short dense pubescence beneath: fruit axillary, small, 3-seeded (?). Manzanillo, March 2 to 18, 1891. No. 1398.

We have not had this genus represented before in the National Herbarium. The specimen is in very poor condition, without good leaves or flowers.

Cayaponia attenuata (Hook. & Arn.) Cogn. in DC. Monogr. Phan. iii. 769 (1881); *Bryonia attenuata* Hook & Arn. Bot. Beech. Voy. 424 (1841?). Climbing over shrubs along the base of hills. Colima, January 9 to February 6, 1891. No. 1146.

These specimens are only in fruit, and we have not the above species in our collection with which to compare them.

I succeeded in growing some specimens of this little vine in 1892, but they had not flowered when killed by frost in November.

Cyclanthera gracillima Cogn. Mem. Cour. Acad. Belg. xxviii. 71 (1878), *fide* Cogniaux. Colima, January 9 to February 6, 1891. No. 1138.

Sicyos sertuliferus Cogn. Bull. Soc. Bot. Belg. xxx. pt. 1. 277 (1891), *fide* Cogniaux. Vigorous, climber; branches slender, somewhat pubescent: leaves oval, $1\frac{1}{2}$ to 3 inches long, cordate at base, acute or acuminate, somewhat 3-lobed, remotely callose-toothed white-papillose and scabrous above, scabrous beneath; petioles

pubescent, 5 to 10 lines long; tendrils 4- to 5-parted. River bottoms. Colima, January 9 to February 6, 1891. No. 1176.

It runs over fences, bushes, and rocks, forming a very dense mass. Sometimes the sterile flowers are abnormally developed, the pedicels becoming 1 inch long and the petals transformed into small leaves.

CACTACEÆ.

Mamillaria sp. Manzanillo, December 1 to 31, 1890. No. 1053.

Echinocactus wislizenii Engelm. Wislitz. Mem. 96 (1848). Agiabampo, October 3 to 15, 1890. No. 803.

Cereus striatus Brandegee, Zoe, ii. 19 (1891). Roots large and tuberous, resembling those of the dahlia. Agiabampo, October 3 to 15, 1890. No. 794. Also from Carmen Island, November 1 to 7, 1890. No. 852.

Dr. Palmer collected this plant in 1887, but it is not reported in Dr. Watson's list. Roots were sent to the Department in 1887 and were grown for some time in the greenhouse, but finally died.

Dr. Palmer says that the large roots are cut into thin slices and dried, and are in this form found in the markets, having various medical uses.

Cereus sp. Manzanillo, March 2 to 15, 1891. No. 1396.

Opuntia sp. Manzanillo, March 2 to 18, 1891. No. 1380.

FICOIDEÆ.

Mollugo verticillata L. Sp. Pl. i. 89 (1753). Common in sandy places near the lagoon. Manzanillo, December 1 to 31, 1890. No. 970.

Glinus lotoides Læfl. It. Hisp. 145 (1758). Rich bottoms. Manzanillo, March 2 to 18, 1891. No. 1345.

RUBIACEÆ.

Exostemma caribæum (Jacq.) Rœm. & Schult. Syst. v. 18 (1819); *Cinchona caribæa* Jacq. Enum. Pl. Carib. 16 (1760). A shrub 8 to 10 feet high. Manzanillo, December 1 to 31, 1890. No. 918.

Rondeletia dubia (?) Hemsl. Diag. Pl. Nov. pt. 2. 28 (1879). Shrub 8 feet high: flowers 4- to 5-parted: calyx-lobes persistent: corolla brownish, glabrous within, unequal, sometimes $3\frac{1}{2}$ lines long. Only a single shrub seen on a river bank. Colima, February 27 and 28, 1891. No. 1311.

I refer this plant here without having seen any specimens of the species, which seems best, although it differs slightly in some of its characters.

Hamelia patens Jacq. Enum. Pl. Carib. 16 (1760); Select. Stirp. Amer. 72 (1763). This species is without number, but is probably from Manzanillo. Letter C.

Hamelia versicolor Gray, Proc. Amer. Acad. xxii. 416 (1887). Fruit black, either 3- or 4-celled. Armeria, February 15, 1891. No. 1277.

Hamelia zorullensis H. B. K. Nov. Gen. et Spec. iii. 414 (1818), *vide* Dr. K. Schumann. Colima, January 9 to February 6, 1891. No. 1164.

Chiococca racemosa. L. Syst. ed. 10. ii. 917 (1759). Manzanillo, December 1 to 31, 1891. No. 1062. Agiabampo, October 3 to 15, 1890. No. 777.

Geophila reniformis (H. B. K.) Don, Prod. Fl. Nep. 136 (1825); *Cephaelis reniformis* H. B. K. Nov. Gen. et Spec. iii. 377 (1818). Very common in low grounds about Manzanillo, December 1 to 31, 1890. No. 1060.

Diodia prostrata Swartz, Prod. Veg. Ind. Occ. 30 (1788). Not common. Colima, January 9 to February 6, 1891. No. 1106.

We have not the typical form of this species with which to compare this, but our plant seems nearer this species than to *D. teres*, although Mr. Pringle's No. 739 (1883), from Chihuahua seems very near our plant.

Crusea rubra Cham. & Schlecht. *Linnaea*, v. 165 (1830). Colima, January 9 to February 6, 1891. No. 1194.

This is the same as Palmer's No. 416 from Jalisco, referred as above by Dr. Gray.

In the same collection (No. 462) is a specimen which Dr. Gray referred to *C. calocephala* DC. This was also collected by Pringle in 1890 (No. 3256) from near the same locality. Both the latter specimens seem to differ from specimens distributed by Capt. John Donnell Smith under the name *C. calocephala*. Mr. Smith's specimens have larger and more strongly veined leaves, and larger calyx (3 lines long) and corolla (4 to 5 lines long), the latter blue: Palmer's and Pringle's Jalisco specimens have the calyx $1\frac{1}{2}$ to 2 lines long, the corolla with very slender tube, 2 to 3 lines long, and purple or rose-colored.

I am inclined to think that Mr. Smith's specimens are the true *C. calocephala*, while the latter belongs to an undescribed species.

Spermacoce sp. Low herb, much branched, and more or less spreading, rough on the angles: leaves linear or narrowly lanceolate: flowers white in dense glomerules, 1 terminal and 2 or 3 lateral: calyx teeth 2: corolla 4-parted: stamens 4: fruit pubescent above. On sandy spots about the lagoon. Manzanillo, December 1 to 31, 1890. No. 974.

This species is near *S. podocephala*, but differs in being an annual, in the character of the leaves, etc.

Spermacoce sp. Along the base of the mountains and about the lagoon. Manzanillo, December 1 to 31, 1890. No. 937.

This species is near *S. asperifolia*.

Richardia scabra L. Sp. Pl. i. 330 (1753). Manzanillo, December 1 to 31, 1890. No. 999.

Galium sp. Sold in the market at Colima. No. 1407.

COMPOSITÆ.

Vernonia triflosculosa H. B. K. Nov. Gen. et Spec. iv. 40 (1820), *fide* O. Hoffmann. Colima, February 27 and 28, 1891. No. 1298.

Elephantopus spicatus Juss. in Aub. Pl. Gui. ii. 808 (1775). Colima, January 9 to February 6, 1891. No. 1184.

Stevia eupatoria (Spreng.) Willd. iii. pt. 3. 1775 (1803); *Mustelia eupatoria* Spreng. Trans. Linn. Soc. vi. 152, t. 13 (1802). Only one plant seen. Colima, January 9 to February 6, 1891. No. 1240.

Stevia trifida Lag. Gen. et Spec. Nov. 27 (1816). Colima, January 9 to February 6, 1891. No. 1158.

Stevia sp. Grows on grassy slopes near the river. Colima, January 9 to February 6, 1891. No. 1219.

Fleischmannia rhodostylis Schultz, Bip. Flora, xxxiii. 417 (1850). Several plants grow together. Flowers rose-colored. Not very common. Found in the shade of rocks, near water. Colima, February 27 and 28, 1891. No. 1295.

This rare plant has only been collected once before and then by Ærsted in 1846-'48, who found it in Nicaragua.

Eupatorium conyzoides Vahl, Sym. Bot. iii. 96 (1794). About 5 feet high, with many spreading or hanging branches: flowers lavender. Common at the base of the mountains. Colima, January 9 to February 6, 1891. No. 1214.

Eupatorium dissectum (Hook. & Arn.) Benth. Bot. Voy. Sulph. 113 (1844); *Phania* (?) *dissecta* Hook. & Arn. Bot. Beech. Voy. 433 (1841). Stems and leaves very succulent: peduncles long; flowers white. Manzanillo, March 2 to 18, 1891. No. 1371.

This plant has not only the corolla of *Hofmeisteria*, as stated by Bentham and Hooker in Gen. Plant., but the whole habit, the foliage, the single heads on long

naked peduncles, etc. Technically it is not a *Hofmeisteria*, because it lacks the outer row of pappus, but its relationships are certainly there.

Eupatorium graciliflorum DC. Prod. v. 145 (1836). A loose-growing plant with many stems, 5 feet high: leaves sometimes $1\frac{1}{2}$ inches broad: pedicels variable, nearly wanting to 8 lines long: flowers 15, white. In the mountains back of Manzanillo, December 1 to 31, 1890. No. 898.

The finding of this plant by Dr. Palmer brings to light an old but little-known species. It is probably not in any American herbarium, nor have they it at Kew. It has only twice before been collected, first by Thaddæus Haenke, in the latter part of the last century—about 1790 or 1792. It was probably obtained on his trip with Luis Née from Acapulco to the City of Mexico. It was next collected by Karwinski, about Acapulco, probably between 1826 and 1831.

Eupatorium quadrangulare DC. Prod. v. 150 (1836). Upright plant, woody at base, 8 to 10 feet high: leaves 15 inches long: flowers white with yellow cast. Colima, January 9 to February 6, 1889. Nos. 1048, 1162.

Eupatorium palmeri Gray, Proc. Amer. Acad. xxi. 383 (1886). Plant 3 to 5 feet high, with weak branches. In various parts of the mountains, growing in shade. Manzanillo, December 1 to 31, 1890. No. 934.

Eupatorium sagittatum Gray, Pl. Wright. i. 88 (1852). Hanging upon fences and bushes for support. Very common. Agiabampo, October 3 to 15. No. 754.

Eupatorium sp. Colima, February 27 and 28, 1891. No. 1310.

Eupatorium sp. Colima, February 27 and 28, 1891. No. 1300.

Eupatorium sp. Manzanillo, December 1 to 31, 1890. No. 889.

Mikania gonoclada DC. Prod. v. 199 (1836). A climbing plant, trailing over bushes and fences along river bottoms. Colima, January 9 to February 6, 1891. No. 1207. Here seems to belong *M. cordifolia* of Smith's Pl. Guatm. pt. 2. 35, collected by John Donnell Smith in Guatemala, 1890.

Brickellia diffusa (Vahl) Gray, Pl. Wright. i. 86 (1852); *Eupatorium diffusum* Vahl, Sym. Bot. iii. 94 (1794). Grows in shade along fences in river bottoms. Colima, January 9 to February 6, 1891. No. 1188.

Brickellia lanata (DC.) Gray, Pl. Wright. i. 84 (1852); *Bulbostylis lanatus* DC. Prod. viii. 268 (1839). Among bushes on river banks at Colima, January 9 to February 6, 1891. No. 1149.

Brickellia coulteri Gray, Pl. Wright. i. 86 (1852). In shady ravines about Manzanillo, December 1 to 31, 1891. No. 947.

Brickellia colimæ Rose, sp. nov. Stems suffruticose, 4 to 5 feet high, short glandular-pubescent: leaves opposite, 1 to $1\frac{1}{4}$ inches long, ovate, acute or obtuse, cuneate or subtruncate at base, crenately-toothed, scabrous above, pubescent beneath: heads mostly on short lateral branches in corymbs of 1 to 5, 11-flowered: involueral bracts in about 3 series, very unequal, more or less pubescent and glandular; outer bracts short, ovate, acute, nerved; inner much larger, hardly nerved, obtuse, purplish: corolla brownish: akenes villous. Grows under shrubs along a river bank at Colima, January 9 to February 6, 1891. No. 1160.

Heterothea inuloides Cass. Diet. Sci. Nat. li. 460 (1827). It is said to have come from the mountains near Colima. No. 1181. Dr. Palmer says: "It is called 'Arnica' here, and is used for the same purposes as the arnica of commerce. It is put up in small packages and sold in the markets of the city." It is the same plant as Palmer's No. 268 (1885) from Jalisco, which Dr. Gray refers to *H. leptoglossa* DC. in Proc. Amer. Acad. xxii. 421, regarding it as only a form of *H. lamareckii*. It seems to me to be a form of *H. inuloides*. Palmer's specimens differ from *H. lamareckii* in having larger heads and more numerous rays, ray-akenes more slender (often abortive) and puberulent, etc.

Bigelovia diffusa (Benth.) Gray, Proc. Amer. Acad. viii. 640 (1873); *Ericameria diffusa* Benth. Bot. Voy. Sulph. 23 (1844). Compact plant, 1 to 3 feet high. Common on the sandy beach at Agiabampo, October 3 to 15, 1889. No. 815.

It is called "Yerba del pasno," and is used as a cathartic.

Egletes viscosa (L.) Less. Syn. Comp. 252 (1832); *Cotula viscosa* L. Sp. Pl. ii. 892 (1753). A low, compact plant, 6 to 8 inches high. Manzanillo, March 2 to 18, 1891. No. 1389.

The range of this species as given by Mr. Hemsley in Biol. Cont.-Amer. is along the Atlantic coast of South Mexico and South America. I cannot learn that it has before been found on the west coast of Mexico. My specimens agree with C. Wright's, from Nicaragua, collected in 1853-56. Here, it seems, should be referred C. Wright's No. 2865, distributed as *E. domingensis*, and Palmer's 1092 of 1878-9, distributed as *Grangea maderaspatana*.

Pringle's No. 4101, distributed as *E. viscida*, seems to be near *E. obovata*.

Erigeron divergens T. & G. Fl. N. Am. ii. 175 (1841), *vide* O. Hoffmann. On banks of streams. Colima, January 9 to February 6, 1891. No. 1236.

Pluchea odorata ? (L.) Cass. Dict. Sc. Nat. xlii. 3 (1826); *Conyza odorata* L. Syst. ed. 10. ii. 1213 (1759). Probably from near Colima. No. 1097a. Leaves thinner and less pubescent than in typical *P. odorata*.

Pluchea subdecurrens Cass. Dict. Sc. Nat. xlii. 4 (1826). Five to six feet high, with few stems: leaves 3 to 6 inches long, the broadest $1\frac{1}{2}$ inches wide. Found along a watercourse among underbrush. Not common. Colima, January 9 to February 6, 1891. No. 1097.

This plant seems to answer to the above species. Very near to it is Palmer's 546 (1880).

Lagascea decipiens (?) Hemsl. Diag. Pl. Nov. pt. 2. 33 (1879). Shrubby, 4 to 6 feet high, glabrous, much branched and open: leaves opposite, ovate, acuminate, 1 to 3 inches long, 3-nerved, slightly dentate, scabrous above and below: heads very numerous, aggregated: involucre 1-flowered, somewhat hirsute, becoming glabrate, 5-toothed: akenes glabrous except a slight puberulence above, 2 lines long; pappus a minute denticulate crown: flowers yellow. In shady woods. Colima, February 27, 1891. No. 1320.

Nearest *L. decipiens*, but the leaves are less dentate, the glomerules and flowers smaller, etc.

Lagascea mollis Cav. Ann. Sci. Nat. vi. 333, t. 44 (1800). Rare about Colima, January 9 to February 6, 1891. No. 1185.

Lagascea suaveolens H. B. K. Nov. Gen. et Spec. iv. 29 (1820). "Flowers dull-white." On grassy hillsides. Colima, January 9 to February 6, 1891. No. 1148.

Guardiola tulocarpus Gray, Pl. Wright. i. 111 (1852); *Tulocarpus mexicana* H. & A. Bot. Beech. Voy. 299 (1840). Bushy, $1\frac{1}{2}$ to 2 feet high: ray 1; disk-flowers 8 or 9. Along river banks. Colima, January 9 to February 6, 1891. No. 1198.

I am somewhat in doubt whether this plant should be referred to *G. mexicana* or as above.

Melampodium perfoliatum (Cav.) H. B. K. Nov. Gen. et Spec. iv. 274 (1820); *Alcina perfoliata* Cav. Ic. i. 11, t. 15 (1791). Along a water ditch. Colima, January 9 to February 6, 1891. No. 1163.

Melampodium sericeum longipes Gray, Proc. Amer. Acad. xxii. 423 (1887). Common on a creek bottom near Colima, January 9 to February 6, 1891. No. 1172.

Melampodium divaricatum (Rich.) DC. Prod. v. 520 (1836); *Dysodium divaricatum* Rich. in Pers. Syn. ii. 489 (1807). Common along water ditches. Colima, January 9 to February 6, 1891. No. 1232.

Parthenium hysterophorus L. Sp. Pl. ii. 988 (1753). Manzanillo, December 1 to 31, 1890. No. 921.

Zinnia palmeri Gray, Proc. Amer. Acad. xxii. 423 (1887). From 2 inches to 1 foot high, much branched and spreading. Smaller throughout, and apparently of somewhat different habit from the type. Manzanillo, December 1 to 31, 1890. No. 893. Also at Colima, January 9 to February 6, 1891. Letter J.

Jägeria hirta Less. Syn. Comp. 223 (1832). An inch to one foot or more high, spreading or erect. Very common along river bottoms at Colima, January 9 to February 6, 1891. No. 1190.

This is Pringle's No. 1282 (1887) distributed as *J. calva* Schultz Bip. To this genus, and perhaps to the same species (although it is taller and has simpler inflorescence) belongs Botteri's No. 1180, referred by Mr. Hemsley to *Spilanthes uliginosa* Biol. Cent.-Amer. ii. 194; also J. D. Smith's No. 930 distributed as *S. sessilifolia*.

Gymnolomia patens Gray, Proc. Amer. Acad. v. 182 (1861). Often 8 feet high with spreading branches, frequently depending for support upon other plants. It is a very abundant bloomer. Colima, January 9 to February 6, 1891. No. 1223.

Agiabampoa Rose in Hoffmann, Wiss. Beil. z. Jahresb. Fried. Werd. Gym. Berl. p. — (reprint, 20) and Eng. & Prantl, Pflanzenf. iv. abt. 5. 390 (1894). A new genus of *Helianthoides*. Heads heterogamous, radiate, few-flowered; ray-flowers sterile, in 1 row; disk-flowers hermaphrodite, fertile. Involucre oblong; bracts in 4 series, broad and obtuse; receptacle very small, almost flat; corolla of ray-flowers without style, spreading, 2-lobed or merely notched; corolla of disk-flowers regular, 5-toothed; proper tube short; throat tubular; stamens entire at base; style-branches short, somewhat flattened, with an ovate, acute tip; akenes a little flattened, cuneate-oblong; pappus none.—Shrubby, much branched; leaves opposite, slender and entire; heads in small compact cymes terminating the branches.

For illustration see Pl. XXXII.

This genus seems to belong to Bentham and Hooker's third section of *Verbesineæ* and near *Varilla*, although it differs from it quite widely.

Mr. Canby in a letter to me points out the close resemblance in habit of this species to *Gymnosperma*, but of course its opposite leaves and bracts on the receptacle keep it distinct from this genus.

Dr. O. Hoffmann, of Berlin, has placed the genus next to *Gymnolomia*, from which it differs in its cylindrical involucre and very unequal bracts.

Agiabampoa congesta Rose, ll. cc. A loose-growing shrub, 4 to 5 feet high, quite woody below with several stems from the base, glabrous or with some hispid pubescence; leaves (uppermost ones often alternate) linear to linear-lanceolate, 3-nerved, a little hispid on both sides, 2 to 6 inches long; heads (sessile or on short pedicels) 3 lines long; involucre bracts 3- to 5-nerved, coriaceous with green tips, oblong and obtuse and with long, oily glands on the back; rays 5, yellow, oval to oval-oblong, $1\frac{1}{2}$ to 2 lines long; disk-corolla 2 lines or less long with a very short proper tube; akenes black, glabrous, $1\frac{1}{2}$ lines long.—Common in rocky creek bottoms. Agiabampo, October 3 to 15, 1891. No. 752.

The bracts are more or less viscid as seems also to be the case with *Varilla*.

Sclerocarpus uniserialis (Hook) B. & H. Gen. Plant. ii. 364 (1873); *Gymnosperms uniserialis* Hook. Ic. Pl. t. 145 (1837). One to one and one half feet high. Only a few plants seen on the mountain side at Manzanillo, December 1 to 31, 1891. No. 975. A spreading or somewhat procumbent form was obtained at Colima, but is without number. Distributed as Letter I.

Montanoa grandiflora DC. Prod. v. 565 (1836). A shrub 10 feet high. Colima, January 9 to February 6, 1891. No. 1159.

Zexmenia greggii Gray, Pl. Wright. i. 113 (1852). Stem 5 to 6 feet high. Along river banks. Colima, January 9 to February 6, 1891. No. 1241.

Zexmenia tequilana Gray in Watson, Proc. Amer. Acad. xxii. 425 (1887). A shrub 10 feet high. On the bank of a creek on the opposite side of bay from Manzanillo, December 1 to 30, 1890. No. 1022.

Tithonia tagetiflora Desf. Ann. Mus. Par. i. 49, t. 4 (1802). About 3 feet high. Only two plants seen in a creek bottom. January 9 to February 6, 1891, No. 1250.

Tithonia tubæformis (Ortega) Cass. Dict. Sc. Nat. xxxv. 278 (1825); *Helianthus tubæformis* Ortega, Hort. Matr. Dec. 181 (1791-1800). About 5 feet high. Grows on the banks of the lagoon. Manzanillo, December 1 to 31, 1890. No. 1076.

In old fields along streams. Colima, January 9 to February 6, 1890. No. 1220.

Viguiera tenuis alba Rose, var. nov. Like the type, but heads and leaves somewhat smaller, bracts of the involucre and receptacle more or less purplish, and rays white.—Grassy hillsides among other plants. Colima, January 9 and February 6, 1891. No. 1151. Nearly past blooming at time of collection.

Viguiera helianthoides H. B. K. Nov. Gen. et Spec. iv. 226, t. 379 (1820). Only a single perfect plant was found, owing to the fact that domestic animals eat it with avidity. Agiabampo, October 3 to 15, 1890. No. 811.

Other specimens were collected at Colima, January 9 to February 6, 1891. No. 1131.

These two forms have been referred to this polymorphous species, although they differ considerably from each other.

Encelia (Simsia) purpurea Rose, sp. nov. Stems 2 to 3 feet high, with spreading branches; younger parts villose-pubescent: leaves ovate, 6 to 18 lines long, acute, truncate or a little cuneate at base, entire or somewhat serrate, appressed-pubescent on both sides, short-petioled: inflorescence somewhat corymbose; peduncles 6 to 18 lines long: heads slender, cylindrical, 3 to 5 lines long; bracts of two lengths, ovate-lanceolate, acute, somewhat hispid, 3- to 5-nerved, more or less purplish: involucre bracts emarginate or short-appendiculate, purplish: rays 5 to 8, 2 to 3 lines long, a little exserted beyond the disk, sterile, slightly 2-toothed, yellow: disk-corolla $2\frac{1}{2}$ lines long, with a very short proper tube (one-fourth line long), a slender cylindrical throat and 5 small teeth: akenes strongly flattened, $2\frac{1}{2}$ lines long, appressed, pubescent: pappus of 2 nearly equal awns a little longer than the akenes.—Only two plants found, these in a creek bottom. Colima, January 9 to February 6, 1891. No. 1105. A peculiar species, resembling *E. exaristata* in the color and shape of the involucre bracts, but of different habit.

Verbesina sphærocephala Gray in Watson, Proc. Amer. Acad. xxii. 428 (1887). Leaves toothed. Bought in the market at Colima, January 9 to February 6, 1891. No. 1404.

Spilanthes alba Willd. Sp. Pl. iii. pt. 3. 1714 (1803). Involucre bracts about 8: rays none: corolla 4-toothed: outer akenes 3-angled; inner ones flat: receptacle high-conical. Grassy plains and river bottoms. Colima, January 9 to February 6, 1891. No. 1192.

This is the *S. alba* of Hemsley's Biol. Cent.-Amer., but differs from the description in the number and shape of the involucre bracts. Fendler's No. 166 from the Isthmus of Panama seems to be the same species. *S. pseudo-acmella* var. of Capt. Wilkes' Exped. (probably from the East Indies) seems very near our plant.

Cosmos sulfureus Cav. Ic. i. 56, t. 79 (1791). About 4 feet high, with a rough pubescence: leaves bi- to tri-pinnatifid, often 12 inches or more long, with rachis and midrib hispid; ultimate pinna, entire or 2- to 3-toothed: peduncles 7 to 10 inches long: bracts of outer involucre 2 lines long, ovate-linear, 3-nerved; inner involucre, twice longer, scarious: rays 6 to 8, oblong; 6 to 9 lines long, 3-toothed, "amber" or deep orange: akenes 8 to 9 lines long, including the long beak, upwardly scabrous and with 2 spreading awns. Not common, and at the time of collection almost past blooming. Colima, January 9 to February 6, 1891. No. 1222.

This species is the same as the one collected by Palmer in Jalisco (1886) and referred as above by Dr. Gray.

I have not seen other specimens of this species, nor have I seen Cavanilles'

plate of the same. The style tips are peculiar for the genus, being long and filiform.

I have grown this species in my grounds from seed. It is a rank, weedy looking plant, with rather coarse foliage. Some of the larger specimens reach the height of 7 feet. None of the plants bloomed out of doors, but they had budded when killed by frost the 1st of November. A small specimen was saved and transplanted to the greenhouse and flowered about the middle of December. The flowers are very attractive and are fully 2 inches in diameter. The chief objection to the plant is its very late blooming, being several weeks later than the commonly cultivated species. The flowering continues for several months.

Bidens pilosa L. Sp. Pl. ii. 832 (1753). In shade along river bottoms. Colima, January 9 to February 6, 1891. No. 1169.

Bidens bipinnata L. form. Awns divergent. Manzanillo, December 1 to 31, 1890. No. 923. Near Palmer's No. 131 (1885) from S. W. Chihuahua.

Galinsoga parviflora Cav. Ic. iii. 41, t. 281 (1794). Only a few plants seen in a river bottom. Colima, January 9 to February 6, 1891. No. 1244.

Calea urticæfolia DC. Prodr. v. 674 (1836); *Calceate urticifolia* R. Br. Trans. Linn. Soc. xii. 109 (1818). Four to eight feet high. A very common plant about Colima, January 9 to February 6, 1891. No. 1215.

Tridax dubia Rose, sp. nov. A slender and more or less procumbent herb, somewhat hirsute: leaves opposite, ovate to lanceolate, serrate: inflorescence a few-flowered corymb; pedicels variable in length, sometimes 2 to 3 inches long: involucrel bracts 5, distinct, herbaceous, ovate, acute: rays yellow, 5, fertile, 3-toothed; disk flowers perfect, fertile: pappus of 10 oblong, obtuse, ciliate-pectinate pale: akenes slightly flattened dorsally, a little pilose.—Along the river bottom; not common. Colima, January 9 to February 6, 1891. No. 1173.

For illustration see Pl. XXXIII.

This species is doubtfully referred to *Tridax*, from which it differs in its less simple inflorescence, involucrel bracts in a single series, and fertile rays, and in the character of the pappus.

Mr. Wm. M. Canby, who has been very much interested in the plants, writes me as follows: "The plant clearly belongs where you place it, viz, in subtribe *Galinsogae*, of tribe *Helianthoideae*. Benthams and Hooker give but 7 genera in this subtribe and this plant is nearly related to but two of these, *Galinsoga* and *Tridax*, and does not fully agree with either. On the whole, however, it seems to me to be sufficiently near *Tridax* to be taken into it. In the detailed generic description of Benthams and Hooker is the phrase concerning the pappus of 'aristato-acuminatæ.' If this were left out you would not have much difficulty in bringing your plant into it. Now, in *Tridax trilobata* (which has been put under *Galinsoga* by good botanists) you have a pappus which is really nearer that of your plant than of other species of *Tridax*. Benthams and Hooker suppress, I think, with reason, all the genera which have been found to accommodate species not just *Tridax* or *Galinsoga* and unite them with the former. Your plant is much like the original species of *Tridax* (*T. procumbens*) in the receptacle, chaff, and scales of the involucre. It approaches *T. trilobata* in the pappus. It seems to me that the simple fact of its having a definite number of pappi which are only ciliate-pectinate instead of plumose-ciliate and which are not aristate should not take it out of a genus in which there is as much variation in species as in *Tridax*."

Tridax procumbens L. Sp. Pl. ii. 900 (1753). Colima, January 9 to February 6, 1891. No. 1183.

Flaveria robusta Rose, sp. nov. About 4 feet high, pubescent or glabrate below: leaves lanceolate or linear above, 3 to 5 inches long, acute to acuminate, tapering into a slender petiole, 3-nerved, entire or slightly serrate: inflorescence open, corymbose; heads small, with 3 involucrel bracts; flowers 3; ray 1, obicular,

about 1 line long; disk flowers 2: akenes $\frac{3}{4}$ of a line long.—Colima, February 27 and 28, 1891. No. 1299. Also collected by Marcus E. Jones, June 28, 1892, near Armeria. No. 276.

This species is near *F. linearis* and *F. longifolia*, but with different leaves, fewer flowers, etc.

Porophyllum palmeri Rose, sp. nov. Perennial, much branched and open, several feet high, reddish and glabrous throughout: leaves opposite, oblong to broadly linear, 9 to 20 lines long, mostly obtuse, with linear glands along the margin: flowers abundant, in numerous small corymbs: involueral bracts 5, 6 lines long, linear, acute, greenish or with purplish margin, with black glands: corolla tube very slender with 5 equal slender lobes: akenes linear, $3\frac{1}{2}$ lines long: pappus abundant, shorter than the corolla.—Collected in a ravine bottom, in the shade of bushes. Colima, January 9 to February 6, 1891. No. 1142.

For illustration see Pl. xxxiv.

This plant seems nearest *P. jorullense*, but differs in its inflorescence, gland-bearing leaves which are not reticulated, its pappus which is shorter than the corolla, etc.

Dysodia tagetiflora Lag. Gen. et Spec. Nov. 29 (1816). Very common on grassy plains about Colima, January 9 to February 6, 1891. No. 1157.

Tagetes subulata Llav. & Lex. Nov. Veg. Desc. fasc. 1. 31 (1824). Collected on the river bank; also bought in the market under the name "Santa Maria." It has a very strong, disagreeable odor, and is manufactured into an insect powder. Colima, January 9 to February 6, 1891. Nos. 1154 and 1180.

Tagetes tenuifolia Cav. Ic. ii. 54, t. 169 (1793). Common in river bottoms at Colima, February 27 and 28, 1891. No. 1318.

Pectis arenaria Benth. Bot. Voy. Sulph. 110 (1844). Leaves 1 to 2 inches long: akenes 4 lines long. The plant grows in the sand just above high tide at Manzanillo. December 1 to 31, 1890. No. 971.

Pectis coulteri Harvey & Gray, Pl. Fendl. 62 (1849). Very common on sandy plains. Agiabampo, October 3 to 15, 1890. No. 759.

Pectis diffusa Hook. & Arn. Bot. Beech. Voy. 296 (1840). Common by river banks at Colima, January 9 to February 6, 1891. No. 1155.

This seems to be Hooker and Arnott's species. The pappus, which is described as of 10 to 29 setæ, is quite variable. These plants have many akenes with 10 to 14 setæ, but often there are only 3 to 5.

It is the same as Palmer's No. 4 (1886) and Pringle's No. 1814 from Jalisco, both doubtfully referred to the above species.

Pectis palmeri Watson, Proc. Amer. Acad. xxiv. 58 (1889). Very common on rich bottoms near creek. Agiabampo, October 3 to 15, 1890. No. 765.

Pectis prostrata Cav. Ic. iv. 12, t. 324 (1797). Not common. Found near the beach. Manzanillo, December 1 to 31, 1890. No. 910.

Brechthites runcinata (Less.) DC. Prod. vi. 295 (1837); *Senecio runcinata* Less. Linnea, vi. 410 (1831). A tall, coarse herb with large leaves 1 to $1\frac{1}{2}$ feet long: flowers red. In moist, shady valleys. Colima, January 9 to February 6, 1891. No. 1145.

Dr. Palmer says this plant seems to have some good medical properties and is much used by the medicine venders under the name of "Maguapas."

Cacalia pringlei Watson, Proc. Amer. Acad. xxv. 156 (1890). Stems 6 feet high: flowers white. Collected on the grassy slope of a hill. Colima, January 9 to February 6, 1891. No. 1234.

Trixis obvallata Hook. & Arn. Bot. Beech. Voy. 300, t. 65 (1840). On grassy hills about Colima, January 9 to February 6, 1891. No. 1235. Also from the markets. No. 1406.

Trixis alata Don, Trans. Linn. Soc. xvi. 192 (1833). A bushy plant, 5 to 10 feet high. Near the base of the mountains. Manzanillo, December 1 to 31, 1890. No. 897.

This plant, which is now collected for the second time, was obtained by Sesse

and Mocino over a hundred years ago (about 1788), but the station is not mentioned; and it is more than sixty years since Don first published (1833) his description.

Mr. Hemsley writes me that the type is probably in the Delessent Herbarium at Geneva, and that the species was not represented in the Kew Herbarium.

LOBELIACEÆ.

Heterotoma tenella, Turcz. Bull. Soc. Nat. Mosc. xxv. pt. 2. 175 (1852). In moist, shady places among rocks along river bottoms. Colima, January 9 to February 6, 1891. No. 1177. Also good specimens from Mrs. H. L. T. Wolcott, to whom seed had been sent.

PLUMBAGINACEÆ.

Plumbago pulchella Boiss. in DC. Prod. xii. 692 (1848). Common along fences. Colima, January 9 to February 6, 1891. No. 1182.

MYRSINACEÆ.

Jacquinia sp. A small tree, 12 feet high with very large top: leaves spatulate to oblanceolate, sharply pungent, glabrous, 3 inches long: flowers in racemes, orange-colored: fruit 1 inch in diameter. Manzanillo, December 1 to 31, 1891. No. 1014.

Lucuma sp. A small shrub, 10 feet high; young branches pubescent: leaves oblanceolate, tapering into a slender petiole (1 inch or more long), glabrous, obtuse or acutish, shining above; 5 to 8 inches long, $1\frac{1}{2}$ to $2\frac{1}{2}$ inches broad: flowers in clusters of 2 to 4, supra-axillary: peduncles 6 to 7 lines long, pubescent: sepals 5, orbicular, obtuse, imbricated, pubescent without, subequal, 3 lines long: corolla dull white, somewhat tubular, 6 lines long, 5-cleft to the middle or into obtuse lobes, puberulent: stamens and staminodia equally inserted near the top of the tube; stamens included on short filaments about equal to the anthers; staminodia linear, longer than the stamens; ovary pubescent, 5-celled: fruit unknown. Manzanillo, March 2 to 18, 1891. No. 1346.

Very similar to a specimen in the National Herbarium from a plant cultivated in Florida under the name *L. fruticosa*.

SAPOTACEÆ.

Bumelia arborescens Rose, sp. nov. A tree with a wide-spreading top; trunk 1 foot in diameter; branches often bearing short, straight thorns: leaves when young clothed with a close, short, reddish pubescence, in age glabrous and shining, oblong, obtuse, 2 to 3 inches long: flowers very numerous in the axils of the leaves: pedicels $1\frac{1}{2}$ to $2\frac{1}{2}$ lines long: calyx and pedicels ferruginous-pubescent: fruit glabrous. Colima, January 9 to February 6, 1891. No. 1123.

Mr. Hemsley writes that they have not this species in the herbarium at Kew. Perhaps nearest *B. persimilis*.

APOCYNACEÆ.

Rauwolfia heterophylla Roem. & Schult. Syst. iv. 805 (1819). A shrub 5 to 6 feet high. Manzanillo, December 1 to 31, 1890. No. 1030. Arméria, February 27 and 28, 1891. Letter H.

Thevetia cuneifolia (H. B. K.) A. DC. Prod. viii. 344 (1844); *Cerberia cuneifolia* H. B. K. Nov. Gen. et Spec. iii. 224 (1818). A shrub 20 feet high, 6 to 12 inches in diameter, leaves often 5 to 6 inches long: flowers yellow. Manzanillo, December 1 to 31, 1890. No. 1069.

This shrub gives out an abundance of milky juice when cut. The plant has apparently only been collected twice, first by Humboldt in flower and next by

Dr. Palmer, in 1886, in fruit. At Manzanillo the plant was both in flower and fruit. It differs but slightly from the description in H. B. K., *Nova Genera et Species Plantarum* vol. iii. The leaves are, however, a little longer.

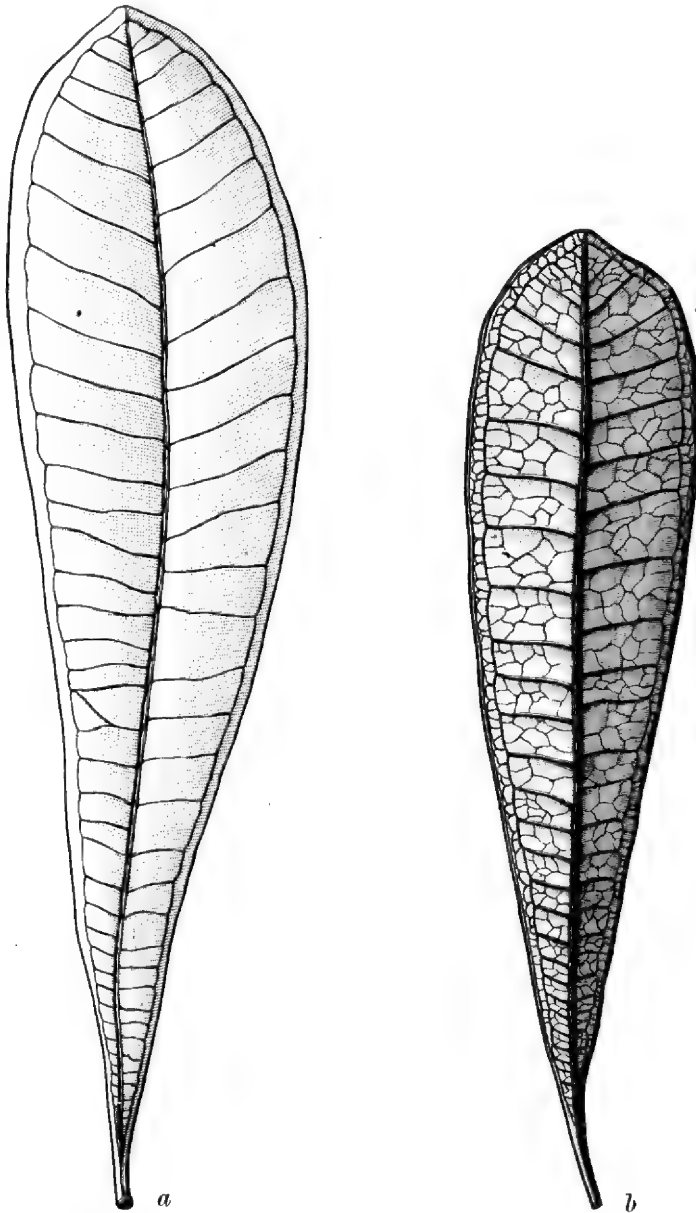


FIG. 7.—*a*, leaf of *Thevetia cuneifolia*, showing upper side; *b*, a smaller leaf, showing lower side; *a* and *b* natural size.

Plumeria sp. A shrub 15 to 20 feet high, 4 inches in diameter. Manzanillo, March 2 to 18, 1891. No. 1394.

This may be *P. mexicana*, but the specimens have neither flowers nor leaves.

ASCLEPIADACEÆ.

Philibertia cumanensis (H. B. K.) Hemsl. Biol. Cent.-Amer. ii. 318 (1881); *Sarcostemma cumanensis* H. B. K. Nov. Gen. et Spec. iii. 195 (1818). Climbing over plants about the lagoon. Manzanillo, December 1 to 31, 1890. No. 1002.

The white flowers are said to be sweet-scented.

Macroscepis sp. A high climber: leaves broadly oblong, 5 to 6 inches long, obtuse or shortly acuminate, rounded at base, sessile, densely tomentose beneath, nearly glabrous above: foliicles 3 inches long, reflexed in fruit, tapering to the apex, densely velvety-pubescent: seeds glabrous, except the long brownish coma. In the mountains about Manzanillo, December 1 to 31, 1890. No. 1028.

This plant is said to climb to the top of the tallest trees. If a *Macroscepis* it is a new species, but as it is only in fruit it is referred to as above. Bourgeau's No. 1510, which seems to be the same as Palmer's plant, is also referred to this genus without name by Hemsley in Biol. Cent.-Amer. ii. 321.

Asclepias curassavica L. Sp. Pl. i. 215 (1753). Leaves very narrow. In low ground. Manzanillo, December 1 to 31, 1890. No. 1047. Armeria, February 15, 1891. No. 1282.

Dr. Palmer says this species is sometimes cultivated in Mexico.

Mrs. H. L. T. Wolcott has grown some very attractive plants from seed sent May 1, 1892, which bloomed November 1. The contrast between the bright orange stamens and the dark corolla is very pleasing.

An interesting note regarding the culture of this species occurs in the Gardener's Chronicle (April 15, 1893). It is there spoken of as a very attractive plant and worthy of a place in our gardens.

Asclepias glaucescens H. B. K. Nov. Gen. et Spec. iii. 190, t. 227 (1818). Leaves 5 to 6 inches long, acute. Colima, January 9 to February 6, 1891. No. 1150.

A comparison of these specimens with those referred to *A. glaucescens*

from the United States shows that the latter belong to a different though closely allied species.

A. glaucescens was described and figured by H. B. K. in Nov. Gen. et Spec. iii., p. 190, t. 227, from plants collected between Acapulco and La Verta de la Moxonera. The following note is from the Bot. Gaz. xvii. 193.

Dr. Gray in Syn. Fl., ii. 92, refers the *A. sullivantii* Torrey, Bot. Mex. Bound. p. 162, to this species. The United States species, however, is clearly distinct from *A. glaucescens*, and should be referred to *A. elata* Benth. Dr. Gray, indeed, in the Syn. Flora, Suppl. p. 407, considers the two to be the same species; but in the light of this new material I am convinced we have two good species, although closely related.

A. elata Benth. has oblong or oval leaves, rounded at the apex, very similar to those of *A. obtusifolia*.

A. glaucescens has much longer and narrower leaves, oblong to linear-oblong and acute: the flowers are much larger in *A. elata*, and the hoods are spreading, exposing the gynostegium; in *A. glaucescens* the hoods are longer instead of shorter than the gynostegium, and erect and connivent. There is also a good

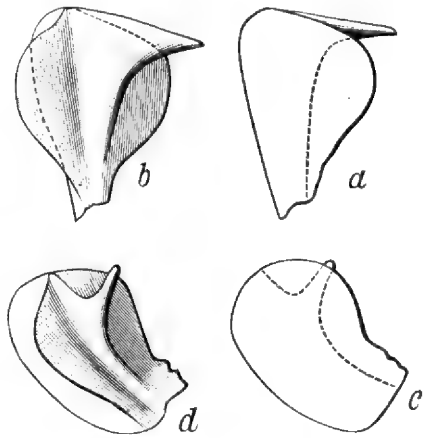


FIG. 8.—a, Hood from *Asclepias glaucescens*; b, the same, showing the horn; c, hood from *A. elata*; d, the same, showing the horn. All enlarged four times.

character in the horns. Dr. Gray clearly describes the form as it is in *A. elata* (under *A. glaucescens* Syn. Fl.), where, in speaking of the hood, he says "the whole length within occupied by a broad and thin crest, which is 2-lobed at the summit, the outer lobe broad and rounded, the inner a short triangular-subulate nearly included horn;" in *A. glaucescens* the horn is a broad, triangular, incurved, entire beak.

LOGANIACEÆ.

- Spigelia** *palmeri* Rose, sp. nov. Annual, simple, 4 to 8 inches long, glabrous: leaves opposite (connected by an ovate membranaceous stipule), oblong to oval, acute or obtuse, tapering at base into a short petiole, glabrous, pale beneath, 1 to 3 inches long, 8 to 20 lines broad, spikes 8-to 12-flowered, terminal or axillary: sepals linear, $1\frac{1}{2}$ lines long, shorter than the capsule: corolla white; tube 4 lines long; lobes 4 to 5 lines long: stamens 5: capsule glabrous.—In wet places across the lagoon from Manzanillo, December 1 to 31, 1890. No. 929.

POLEMONIACEÆ.

- Lœselia ciliata* L. Sp. Pl. ed. 2. ii. 875 (1763). Common along river bottoms. Colima, January 9 to February 6, 1891. No. 1175.
Lœselia coccinea (Cav.) Don, Gen. Syst. iv. 247 (1838); *Hoitzia coccinea* Cav. Ic. iv. 44, t. 365 (1797). In mountain ravines. Colima, February 27 and 28, 1891. No. 1301.

This plant is called "Espineilla," and is used in many places in Mexico as a medicine.

- Lœselia glandulosa* (Cav.) Don, Gen. Syst. iv. 248 (1838); *Hoitzia glandulosa* Cav. Ic. iv. 45, t. 367 (1797). Collected along streams. Colima, January 9 to February 6, 1891. No. 1152.

HYDROPHYLLACEÆ.

- Nama jamaicensis* L. Sp. Pl. ed. 2. i. 327 (1762). Colima, January 9 to February 6, 1891. No. 1233.
Hydrolea spinosa L. Sp. Pl. ed. 2. i. 328 (1762). A small specimen found at the side of a dry ditch near Colima, February 27 and 28, 1891. No. 1305.

BORAGINACEÆ.

- Cordia* sp. A tree 25 feet high, about 10 inches in diameter, younger stems whitish: leaves broadly lanceolate to broadly ovate, acute to somewhat acuminate, with truncate or somewhat cuneate base, green and smooth above, whitish and with a short, close pubescence below: flowers very abundant in large open panicles: pedicels short, mostly 1 line long, sometimes 4 lines long: flower-buds globular, opening by a deciduous operculum: calyx short-campanulate, 2 to 3 lines long, whitish pubescent, somewhat 10-ribbed, with small teeth: corolla with short tube scarcely longer than the calyx, limb spreading (10 to 12 lines broad) deeply cut into 5 oblong, obtuse lobes, white (?), marcescent: stamens 5, exserted: style twice 2-parted: drupe ovate-acuminate, 4-celled. A very common tree about Manzanillo and worthy of cultivation. December 1 to 31, 1890. No. 895.

The marcescent corolla seems to ally this species with De Candolle's section *Geracanthus*. Of all the specimens of *Cordia* which we have seen, it most resembles *C. (Varronia) alba*.

- Cordia alba* (Jacq.) Roem. & Schult. Syst. iv. 466 (1819); *Varronia alba* Jacq. Select. Stirp. Amer. p. 41 (1763). Manzanillo, March 2 to 18, 1891. No. 1369.

*To this genus should be referred *Calophanes palmeri* Gray, Proc. Amer. Acad. **xxii.** 443, which is probably *S. scabrella* Benth. or near it.

Tournefortia capitata Mart. & Gal. Bull. Acad. Brux. xi., pt. 2, 332 (1844). Colima, January 9 to February 6, 1891. No. 1243.

Tournefortia floribunda H. B. K. Nov. Gen. et Spec. iii. 89 (1818). A high woody climber: flowers greenish yellow. Very common along streams, and at the base of mountains. Colima, January 9 to February 6, 1891. No. 1210. Manzanillo, March 2 to 18, 1891. No. 1359.

This plant almost completely covers the bushes and shrubs over which it runs. Dr. Palmer speaks of a large shrub 15 feet high, with considerable spread of branches, which was entirely hidden by it. I do not find that this plant is reported from Mexico, but it seems to be common there, and as it corresponds fairly well with the description and with a single specimen from Brazil, I have no hesitancy in referring it as above.

Tournefortia hirsutissima (?) L. Sp. Pl. ed. 2. i. 201 (1762). Tall shrubby climber covering the tops of the highest trees with its numerous branches: the small drupes at first dull white and fleshy: in age hard and dry. Manzanillo, December 1 to 31, 1890. No. 1043.

This plant seems to be the same as the one obtained by C. Wright in Nicaragua, and also referred as above. In both of these specimens the leaves are nearly glabrous in age. In De Candolle's Prodrum this species is described as "*fruticosa erecta*." Also about Colima, January 9 to February 6, 1891. No. 1242. But in these specimens the leaves are very scabrous and more pubescent.

Heliotropium curassavicum L. Sp. Pl. i. 130 (1753). Manzanillo, March 2 to 18, 1891. No. 1343.

Heliotropium phyllostachyum Torr. Bot. Mex. Bound. 137 (1859). Manzanillo, December 1 to 31, 1890. No. 891.

Heliotropium indicum L. Sp. Pl. i. 130 (1753). Manzanillo, December 1 to 31, 1890. No. 953. March 2 to 18, 1891. No. 1378.

Heliotropium inundatum Swartz, Prod. Veg. Ind. Occ. 40 (1788). Colima, January 9 to February 6, 1891. No. 1122. Manzanillo, March 2 to 18, 1891. No. 1361.

Heliotropium parviflorum L. Mant. ii. 201 (1771). Manzanillo, December 1 to 31, 1890. No. 915.

CONVOLVULACEÆ.

Ipomœa (Orthipomœa) wolcottiana Rose, Garden and Forest, vii. 367 (1894). A tree, 30 feet high, sometimes 1 foot in diameter: branches slender, somewhat drooping: leaves ovate to ovate-lanceolate, 3 to 5 inches long, $1\frac{1}{2}$ to $3\frac{1}{2}$ inches broad, rounded or truncate at base, acuminate, glabrous, on petioles 2 to 4 inches long: flowers in numerous short racemes or corymbs mostly naked: pedicels jointed near the base, little if at all thickened upward, 4 to 6 lines long: calyx 5 to 6 lines long, glabrous: sepals nearly equal, oblong or oval, rounded at apex: corolla white, broadly campanulate, $2\frac{1}{2}$ inches broad, with a short thick tube 1 inch long: capsule oblong, 9 lines long, glabrous, 2-valved, 4-seeded, separating into 4 carpels: seeds oblong, 4 lines long with the margins covered with a long reflex coma longer than the seed. Manzanillo, March 2 to 18, 1891. No. 1342.

Dr. Palmer speaks of this as a tree with a large top, hanging branches, and a great profusion of flowers. The flowers generally appear before the leaves, but when both appear together the flowers are found in the axils of the leaves forming short, leafy racemes. It is called "Acote" and the bark is used in the preparation of a tea which is taken for diseases of the kidneys.

Ipomœa bracteata Cav. Ic. v. 51, t. 447 (1799). Agiabampo, October 3 to 15, 1890. Letter D.

Ipomœa nelsoni Rose, sp. nov. Climbing, abundantly hirsute: leaves cordate, with open sinus, obtuse to somewhat acuminate, $1\frac{1}{2}$ to 3 inches long (peduncles mostly shorter, sometimes longer) glabrous or nearly so: peduncles slender, longer than

the leaves, glabrous, 2- to 12-flowered; calyx 1 line long, the lobes oblong-ovate, obtuse; corolla funnel-form, glabrous, 9 to 12 lines long, orange color; stamens included: style included, stigma 2-lobed: capsule glabrous, 2 lines in diameter, 2-celled, 4-ovuled, 2- to 4-seeded.—A great climber over fences and bushes. Very common in the bottom of a creek near where it empties into the lagoon. Manzanillo, March 2 to 18, 1891. No. 1363. Also collected by E. W. Nelson in a deserted field near the town of Tuxtepec, Oaxaca, April 9, 1894. No 318.

For illustration see Pl. xxxv.

This is a very handsome climber and well worthy of cultivation.

I have grown specimens in the greenhouse of the Agricultural Department, as has also Dr. B. L. Robinson at Cambridge. It is a very delicate little vine and its yellow flowers are very attractive.

Near to *I. microsepala* Benth. (Bot. Voy. Sulph. 136), which species I have not seen. Mr. Helmsley writes me, however, that "*I. microsepala* has quite a narrow corolla", and that he also takes Palmer's plant to be new.

Ipomœa pes-capræ Roth, Nov. Pl. Sp. 109 (1821); *Convolvulus pes-capræ* L. Sp. Pl. i. 159 (1753). Manzanillo, December 1 to 31, 1890. No. 1055.

Ipomœa peduncularis Bertol. Fl. Guatem. 8, t. 2 (1840). Colima, January 9 to February 6, 1891. No. 1104.

Ipomœa quinquefolia L. Sp. Pl. i. 162 (1753). Flowers white. Along the banks of a lagoon. Manzanillo, December 1 to 31, 1890. No. 1017. Only a single plant seen.

Ipomœa sidæfolia Choisy, Mem. Soc. Phys. Genev. vi. 459 (1833). A high-climbing plant and an abundant bloomer: flowers white with the tube blotched with purple. Along the side of the river emptying into the lagoon at Manzanillo, December 1 to 31, 1890. No. 1049.

Ipomœa umbellata (L.) G. F. W. Mey. Prim. Fl. Esseq. 99 (1818) not L.; *Convolvulus umbellatus* L. Sp. Pl. 155 (1753). Colima, January 9 to February 6, 1891. No. 1099. The flowers, which are yellow, open late in the morning and do not close until late in the day.

***Ipomœa* sp.** Low climber, glabrous; leaves pinnate or pedately 7-parted; segments glabrous, linear to linear-lanceolate, more or less toothed; petioles short; peduncles $1\frac{1}{2}$ to 2 inches long, 1- to 2-flowered; petioles 6 to 12 lines long, much thickened in fruit; sepals imbricate, equal, 5 to 6 lines long, oval to oblong, rounded at apex with a scarious margin; corolla in bud covered with long silky hairs tinged with yellow, wheel-shaped with a slender tube shorter than the calyx; anthers partly exerted and twisted. No. 781.

This species belongs to Choisy's sub-section *Multiloba* of *Strophipomœa* as laid down in DC. Prod. vol. ix. As considered by others, it would be referred to the section *Operculina*; for although the capsule is not strictly circumscissile, yet it is clearly differentiated into an upper and lower part. A. Peter in Engler and Prantl, Pflanzenf. keeps *Operculina* distinct from *Ipomœa* on account of the capsule, but I do not find that this character holds in the Mexican species. *I. rhodocalyx* Gray has a very different leaf and corolla from my species, but the capsule has very thin valves throughout, irregularly breaking apart.

***Ipomœa* sp.** Trailing or low-climbing plant: leaves palmately parted: corolla purplish. Common on mountain side. Manzanillo, December 1 to 31, 1890. No. 1031.

***Ipomœa* sp.** Low climber: leaves cordate and with a deep sinus: flowers in umbellate clusters: corolla pinkish. At base of mountains. Manzanillo, December 1 to 31, 1890. No. 978.

***Ipomœa* sp.** A low climber. Not common. Agiabampo, October 3 to 15, 1890. No. 774.

- Evolvulus linifolius** L. Sp. Pl. ed. 2. i. 392 (1762). Only a few specimens seen. Manzanillo, December 1 to 31, 1890. No. 952.
- Cuscuta** sp. Manzanillo, December 1 to 31, 1890. No. 948.
- Cuscuta** sp. Manzanillo, December 1 to 31, 1890. No. 949.

SOLANACEÆ.

- Solanum amazonium** Ker, Bot. Reg. i. t. 71 (1815). A very thorny shrub, 2½ feet high. Manzanillo, December 1 to 31, 1890. No. 1035.
- Solanum callicarpæfolium** Kunth & Bouche in DC. Prod. xiii. pt. 1. 107 (1852). Five to six feet high; flowers dull white; fruit yellow. Along the margin of the lagoon and in the neighboring swamps. Manzanillo, December 1 to 31, 1890. No. 1051.
- Solanum grayi** Rose, Contr. Nat. Herb. i. 108 (1891). Stems 3 feet high. Common on grassy bottoms. Colima, January 9 to February 6, 1891. No. 1202.
- This species was recently collected by W. G. Wright (determined by Dr. B. L. Robinson) near Mazatlan.
- Solanum tequilense** Gray in Watson, Proc. Amer. Acad. xxii. 441 (1887). Two to three feet high; flowers white; fruit yellow. Colima, February 27 and 28, 1891. No. 1327.
- Probably this species, although the spines are fewer and stouter. Only a few flowers and 2 leaves were obtained.
- Solanum triste** Jacq. Enum. Pl. Carib. 15 (1760). Shrub 4 feet high. In swamps across the bay from Manzanillo, December 1 to 31, 1890. No. 1001.
- Solanum** sp. Shrub about 6 feet high; branches and leaves more or less prickly: leaves entire or repandly toothed; flowers white. Colima, January 9 to February 6, 1891. No. 1179.
- Capsicum baccatum** L. Mant. i. 47 (1767). Agiabampo, October 3 to 15, 1890. No. 772.
- This small pepper, which is very common all over the State of Sonora, is much used by the Mexicans. Some years capsules are gathered in great quantities and shipped to San Francisco, where they are made into pepper sauce.
- Cestrum macrophyllum** Vent, Choix. 18 (1803). Shrub, 5 feet high. Colima, January 9 to February 6, 1891. No. 1246.
- Nicotiana plumbaginifolia** Viv. El. Pl. Hort. Bot. Dinagro, 26 (1802). Colima, January 9 to February 6, 1891. No. 1121.

SCROPHULARIACEÆ.

- Russelia sarmentosa** Jacq. Select. Stirp. Amer. 178, t. 113 (1763). On the mountain sides. Manzanillo, December 1 to 31, 1890. No. 954.
- Stemodia palmeri** Gray, Proc. Amer. Acad. xxi. 403 (1886). Among rocks along a river. Colima, January 9 to February 6, 1891. No. 1252.
- Stemodia parviflora** Ait. Hort. Kew. ed. 2. iv. 52 (1812). Habitat similar to that of above species. No. 1178.
- Stemodia durantifolia** Swartz, Obs. 240 (1791). Along a ditch. Colima, January 9 to February 6, 1891. No. 1112.
- Herpestis chamædryoides** H. B. K. Nov. Gen. et Spec. ii. 369 (1817). Common. Colima, January 9 to February 6, 1891. No. 1237.
- Herpestis monnieri** (L.) H. B. K. Nov. Gen. et spec. ii. 366 (1817); *Gratiola monnieri* L. Amoen. Acad. iv. 306 (1759). Common about the lagoon at Manzanillo, March 2 to 18, 1891. No. 1376.
- Scoparia dulcis** L. Sp. Pl. ed. 2. i. 168 (1762). Manzanillo, December 1 to 31, 1890. No. 894.
- Capraria saxifragæfolia** Cham. & Schlecht. Linnaea, v. 105 (1830). Near the base of the mountains. Manzanillo, December 1 to 31, 1890. No. 917.

Buchnera mexicana (?) Hemsley, Biol. Cent.-Amer. ii. 457 (1882). Colima, January 9 to February 6, 1891. No. 1168.

Specimens found in poor condition, and hence the specific determination is somewhat uncertain.

BIGNONIACEÆ.

Bignonia unguis-cati (?) L. Sp. Pl. ii. 623 (1753). Climbing over small trees and bushes. Manzanillo, December 1 to 31, 1890. No. 1072.

This is doubtfully referred here, as the specimens are without flowers or fruit, but it agrees with C. Wright's specimens from Nicaragua collected on the Ringgold and Rogers Exploring Expedition, 1853-1856.

Tabebuia donnell-smithii Rose, Bot. Gaz. xvii. 418, t. 26 (1892). A tree 50 to 75 feet high, often 4 feet in diameter: leaves palmately compound on long peduncles 5 to 10 inches long; leaflets 7, very variable in size (the largest on petiolules 1 to 3½ inches long), oblong to ovate, acuminate, rounded or truncate at base, serrate, glabrate in age, 2 to 10 inches long, often 3 inches broad: flowers arranged in a large terminal panicle of small cymes, 8 inches long, with short glandular-pubescent throughout: cymes few-flowered, with deciduous scarious bracts; pedicels 6 lines long: calyx closed in bud, deeply cleft and two-lipped in flower, 6 lines long: corolla yellow, tubular, 5-lobed; tube 1 to 1½ inches long; limb 1½ inches broad: stamens 4, included, didynamous; filaments incurved, glabrous except at base; anther cells glabrous, oblong; sterile filament 1½ lines long: ovary sessile: pods 12 inches or more long, 10-ribbed, glandular-pubescent and loculicidally dehiscent: seeds in 2 rows. Common on the mountains about Colima and cultivated about the town. Collected by Capt. John Donnell Smith, at Cuyuta in the department of Escuintla, at an altitude of 200 feet, April, 1890, No. 2070; and, also, by Dr. Edward Palmer, at Colima, January 9 to February 6, 1891. No. 1098.

This is said to be one of the most beautiful trees of Mexico, and is called "Primavera." The flowers are of a beautiful golden yellow, produced in great abundance, and generally appearing before the leaves. The trees are often large, sometimes 4 feet in diameter, and the wood very valuable. The trunks are cut into logs about 12 feet in length and shipped from Manzanillo, in the State of Colima, to the United States, principally to Cincinnati and San Francisco, where they are much used for cabinetwork and veneering. The tree is very common in the lower part of the department of Escuintla; it is tall and slender, usually leafless, and with the profuse delicate yellow flowers standing out against the sky like golden clouds.

The following note is from a letter of J. D. Smith, January 7, 1892: "The trees were too branchless for my servant to climb, too stout for him to fell with his machete, and too high for me to discern what manner of leaves were those which occasionally showed themselves among the flowers. My flowers were all picked up on the ground. I think there must be many trees in those countries of which botanists have not been able easily to collect specimens, and which, therefore, remain unknown."

I have not been able to place in any known species this interesting tree. It seems curious that a tree so widely distributed, of such attractive flowers, and of some commercial importance should have remained unknown to botanists. The species, while not agreeing in all respects with *Tabebuia*, answers better to this than to any other known genus. In its inflorescence and ribbed pods it is more like *Godmannia* and *Cybistar*, but does not agree in other particulars.

Since the above description of this tree was published by me in the Botanical Gazette I have written to several New York dealers in imported woods and learn that they are well acquainted with it. I give two of these letters. Mr. John R. Graham wrote, under date of December 29, 1892:

"Replying to your postal, 'Primavera' or 'white mahogany' are the two names for the same wood, which grows in Mexico. It is used largely in the manufacture of fine furniture and interior decoration. We handle it in the logs and lumber, also veneers. Worth from 12 cents per foot in the log to 15 to 25 cents in lumber."

William E. Uptegrove & Bro. write, under date of December 29, 1892:

"We do handle 'Primavera' or 'white mahogany.' The two names are used for the same wood. The former is correct. It is a native of Mexico. That growing on the west coast is the best. It is used only moderately and costs somewhat higher than 'red' mahogany. We do not consider it a desirable cabinet wood."

A condensed account of the original description is given in Hardwood (vol. iii. 21), by Geo. B. Sudworth.

Prof. C. S. Sargent, in Garden and Forest (vol. vi, p. 12), says:

"In the December issue of The Botanical Gazette there is a figure reproduced from one of Mr. Faxon's drawings of a species of *Tabebuia*, a native of Mexico and Central America, which Prof. Rose, of the Department of Agriculture, describes as a new species, and which he dedicates to Mr. John Donnell Smith, of Baltimore, its discoverer. For the last twelve or fifteen years a handsome, light-colored wood has been imported into the market of San Francisco from the west coast of Mexico, and is said to have been produced by a tree called 'Primavera.' This wood, of late years, has been quite extensively brought into the Eastern markets under the name of 'white mahogany,' and is now considered here one of the most valuable and useful of all cabinet woods. Its origin has long remained unknown, and although there may be still some doubt as to the identity of white mahogany with the 'Primavera' of Manzanillo, Prof. Rose's note gives the indication of the direction in which further investigations of the origin and source of supply of this wood should be made."

Tecoma stans (L.) Juss. Gen. Plant. 139 (1789); *Bignonia stans* L. Sp. Pl. ed. 2. ii. 871 (1763). Collected in the public square at Guaymas, July 30, 1891.

This plant is commonly cultivated in Mexico for its handsome flowers.

Farmetiera sp. A small tree, 12 feet high with horizontal branches; leaves in fascicles of 2 to 5 subtended by a single spine; leaflets 3, obovate, obtuse, entire or toothed towards the apex; petioles slightly winged, about the length of the leaflets; pods 10 inches long, yellow. In shady woods about Manzanillo, March 2 to 18, 1891. No. 1347.

This species differs certainly from *P. cereifera* and *P. edulis*, which by some are considered the only two species; from the former it differs in its pods, acuminate leaflets and calyx; from the latter, in its pods, etc. Miers considered there were six species; of these it seems nearest to *P. foliolosa*, but differs in being spiny; *P. aculeata* has similar spines, but its leaflets are often simple; in *P. lanceolata* all the leaflets are simple; *P. alata* has very properly been referred to the genus *Crescentia*.

Mr. John Donnell Smith has since written me that he has in his collection two numbers which he considers the same as mine, which he has referred to *P. edulis*.

ACANTHACEÆ.

Calophanes sp. Armeria, February 15, 1891. No. 1274.

Calophanes sp. Compact plant, 2 to 3 feet high; leaves oblong, acuminate, tapering at base into a short petiole, glabrous beneath, slightly scabrous above, 3 to 6 inches long; upper leaves smaller and narrower; flowers axillary or forming leafy spikes; calyx puberulent; tube 2 lines long; lobes unequal, filiform 3 to 4 lines long; corolla violet, puberulent without, $1\frac{1}{2}$ to $1\frac{3}{4}$ inches long; tube slender; lobes obtuse, equal, spreading; stamens 4, nearly equal, slightly

exserted; anthers 2-celled, obtuse at base: capsule slightly compressed, 5 lines long including the short stipe, cinereous-puberulent: seeds 4 (2 to each cell), much flattened. Armeria, February 15, 1891. No. 1286.

This species has the stamens of *Ruellia*.

A peculiar form growing with the above has short woolly pubescence and bright crimson flowers. No. 1287.

Ruellia albicaulis Bertero, in Spreng. Syst. Veg. ii. 822 (1825). Flowers lilac. A very common plant growing in thick shady woods. Colima, February 27 and 28, 1891. No. 1321.

In this species the ovules are only 2 in each cell and only one in each cell matures. In this respect the species has the character of *Calophanes*. This peculiarity I find holds in *J. D. Smith's* Guatemala plant as well as in that of C. Wright from Nicaragua.

Ruellia tuberosa L. Sp. Pl. ii. 635 (1753). Along creek bottoms. Agiabampo, October 3 to 15, 1890. No. 757.

Ruellia sp. Flowers lilac color. Among underbrush along a river bank. Colima, February 27, 1891. No. 1313.

Blechnum brownii Juss. Ann. Mus. Par. ix. 270 (1807). This is a very common plant about the mouth of the river which enters the lagoon near Manzanillo. It grows in the shade. March 2 to 18. No. 1357.

Justicia mexicana Rose, sp. nov. An upright shrub, sometimes 6 feet high, glabrous or nearly so: leaves short-petioled, ovate, acuminate, glabrous or with some appressed pubescence: flowers few on short axillary branches: bracts 3, linear, 6 lines long: bractlets filiform: calyx deeply 5-cleft, its lobes 3 lines long: corolla scarlet, $1\frac{1}{2}$ inches long, puberulent, deeply bilabiate; upper lip erect, entire or with a slight notch; lower lip spreading, 3-cleft: stamens 2; anthers 2-celled, unequally exserted, the lower one slightly mucronate: capsule 2 lines long, on a stipe of equal length, glabrous, 2-celled, 4-seeded: seeds reddish, glabrous.—In rich bottoms, growing in shade. Agiabampo, October 3 to 15, 1890. No. 788.

This species is near *J. palmeri*, but with more acuminate leaves, narrower bracts, etc.

Justicia paniculata Rose, sp. nov. One or two feet high, much branched, glandular-pubescent and somewhat villose, older parts with whitish bark and glabrate: leaves lanceolate, acute, or slightly acuminate, or lower ones oblong to oval and obtuse, cuneate at base into a short petiole, pubescent beneath, becoming glabrate above: panicles sometimes axillary, 2 to 4 inches long: flowers sessile: bracts and bractlets small, filiform, $1\frac{1}{2}$ lines long: calyx deeply 4-parted into filiform lobes 4 lines long, glandular-pubescent: corolla somewhat swollen, "white, tinted with mauve," 5 to 6 lines long, two-lipped; lower lip 3-lobed, spreading; upper lip erect, rostrate, and bidentate: stamens 2; anther cells 2, oblique, hairy on the back, separated by a broad connective, broader above; lower cells appendiculate or coalescing with the connective: style a little hairy below and also the ovary: capsule 6 to 8 lines long, puberulent, 4-seeded: seeds $1\frac{1}{2}$ lines in diameter with a short, thick pubescence.—Along a river bottom in the shade. Only three plants seen. Colima, January 9 to February 6, 1891. No. 1143.

Dianthera (?) sp. Leaves oblong, 3 to 4 inches long, on short petioles, acute: flowers in long, slender, unilateral spikes: corolla 2-lipped; upper lip entire, lower lip 3-lobed: stamens, 2; filaments broadened; anther cells 2, unequally inserted: capsules $5\frac{1}{2}$ lines long including the slender stipe, acuminate, cells each 2-seeded: seeds very flat, cordate, papillose.—On the mountain sides about Manzanillo, December 1 to 31, 1890. No. 892.

These specimens are in fruit, but from some buds the flower characters were made out. This resembles *Carlownrightia*, but the stamens seem to place it in the above genus.

Carlowrightia arizonica Gray, Proc. Amer. Acad. xiii. 364 (1878). A diffuse shrub, sometimes 3 feet high: largest leaves 1 inch long, jointed near the base.—Growing among other shrubs. Agiabampo, October 3 to 15, 1890. No. 769.

Only a few specimens were collected and these are in fruit with no flowers.

Jacobinia auriculata Rose, sp. nov. Two to three feet high: branches sharply 4-angled: leaves glabrous, 3 to 6 inches long, broadly lanceolate, acuminate, tapering into a winged petiole with an auriculate base: flowers in a dense panicle of racemes, bracts and bractlets small: peduncles in fruit 6 lines long: calyx 2 lines long, deeply cleft into 5 equal acuminate sepals: corolla crimson, 1 inch long, 2-lipped; upper lip 2-lobed: stamens 2, inserted at the top of the slender corolla tube: anther cells 2, equal and parallel: capsule 12 to 15 lines long (including the very slender stipe), glabrous: cells 2-seeded: seeds $2\frac{1}{2}$ lines in diameter.—Colima, February 27 and 28, 1891. No. 1323.

Jacobinia sp. Four to five feet high, somewhat open: leaves ovate-lanceolate, acuminate, cuneate at base, 2 to 3 inches long, glabrous or a little villose on the veins, short petioled: flowers in small, axillary or terminal clusters: bracts filiform, 5 to 6 lines long, slightly hairy; bractlets 2, similar but shorter: calyx puberulent, 2 lines long, cleft below the middle into 5 ovate-acuminate lobes: corolla scarlet, puberulent without, 15 lines long, 2-lipped; upper lip (interior in bud) erect, entire; lower lip 3-cleft to near the middle: stamens 2, each 2-celled; anther cells parallel, almost equally inserted, oblong, 1 line long, muticous at base: capsule (including the stipe) 7 lines long, 2-celled, 2 seeds to each cell; seeds 1 line in diameter, roughened. In shade of bushes in the mountains. Manzanillo, December 1 to 31, 1890. No. 946.

With only scanty material and scattered descriptions of the various species of this genus, I think it is best not to name what seems to be a new species.

Dicliptera resupinata (Vahl) Juss. Ann. Mus. Par. ix. 268 (1807); *Justicia resupinata* Vahl, Enum. Plant. i. 114 (1804). Colima, January 9 to February 6, 1891. No. 1171.

Tetramerium aureum Rose, sp. nov. Two to three feet high, with numerous branches, hispid- and short glandular-pubescent: leaves ovate to lanceolate, rounded at base, 1 to $2\frac{1}{2}$ inches long, 9 to 12 lines broad, strongly nerved at base: bracts 4 to 5 lines long, oblong to spatulate-oblong, obtuse; bracteoles 2, linear-oblong, obtuse, 3 to 4 lines long, 1-nerved: calyx deeply 5-parted with slender lobes 2 lines long: corolla yellow, 1 inch long; tube slender, 3 to 4 lines long; lobes 4: stamens 2; anthers 2-celled, parallel: ovary glabrous, 3 lines long, 2-celled; cells 2-seeded.—Common in shady woods. Colima, January 9 to February 6, 1891. No. 1302.

The bracteoles are like those of *Dicliptera*, but the corolla is that of *Tetramerium*.

Tetramerium (?) diffusum Rose, sp. nov. Annual, diffuse, much branched, rooting at the nodes: leaves ovate to lanceolate, acute or obtuse: flowers in loose terminal spikes: bracts and bractlets 3 to 4 lines long, narrowly oblong: calyx very small, deeply cleft into unequal lobes: corolla 2-lipped; lower lip deeply 3-parted: stamens 2, 2-celled; cells parallel: capsule small, 2 lines long on a very short thick stipe: cells 2-seeded, papillose-roughened.—Near the ocean among the rocks. Manzanillo, December 1 to 31, 1890. No. 994.

The bractlets are those of *Dicliptera*, but the corolla does not agree.

Tetramerium hispidum Nees in DC. Prod. xi. 468 (1847). Very common along river bottoms. Colima, January 9 to February 6, 1891. No. 1132.

Tetramerium tenuissimum Rose, sp. nov. A foot or so high with many slender branches: leaves narrowly-oblong to ovate, obtuse or acute, 1 to 2 inches long: spikes short, terminal: bracts ovate, apiculate, 3 to 4 lines long, 3-nerved at base: bractlets 2; filiform, 2 to 3 lines long, longer than the calyx: calyx 5-parted into filiform lobes: corolla white, 4 lines long, 2-lipped, lower lip exterior, deeply 3-cleft; upper lip entire; stamens 2, anterior, inserted at the top of the short corolla

tube: filaments hairy below; anther-cells 2, oval, equal, parallel: capsule puberulent, 2 lines long, 4-seeded; placenta separating from the valves: seeds $\frac{1}{2}$ line in diameter, papillose.—A very common plant growing in the shade. Colima, February 27 and 28, 1891. No. 1297.

I have not seen the little known *T. ovalifolium*, but I judge that my plant is clearly distinct. Besides this, the former was collected farther south.

Henrya scorpioides (L.) Nees in DC. Prod. xi. 491 (1847); *Justicia scorpioides* L. Sp. Pl. ed. 2. i. 21 (1762). Low, of spreading habit, 8 to 12 inches high, involucre $3\frac{1}{2}$ lines long: corolla white: capsule 2 to $2\frac{1}{2}$ lines long: seeds $\frac{1}{2}$ line in diameter. Manzanillo, March 2 to 18, 1890. No. 1330a.

Dr. Palmer sends another plant from near the same place, which differs considerably from it in habit. Branches very long and slender, rooting at the joints: leaves more oval, on very long petioles, beneath glabrate; involucre very pilose, less glandular, the appendiculation stronger. In shade at the edge of a lagoon. March 2 to 18, 1891. No. 1330.

Bentham in Botany Sulphur speaks of this genus as being a shrub. Our specimens, while the plants are probably perennial, having a small, indurated root, can not bear the dignity of shrubs.

The restoration of the *Henrya* of Nees supplants the *Henrya* of Hemsley (Journ. Linn. Soc. xxvi. 111), and which that author has recently (Bull. Torr. Club, xix. 97) renamed *Neohenrya*.

Barleria micans Nees in Benth. Bot. Voy. Sulph. 146 (1844).

One to two feet high: leaves 8 to 10 inches long, narrowly oblong to oblong-lanceolate. A very showy plant. Growing in shade. Colima, January 9 to February 6, 1891. No. 1144.

Dr. Palmer's notes state that the flowers are sulphur-yellow, but this must be a mistake; in the herbarium specimens they are dark violet.

In this species only the 2 anterior stamens are developed, but there are 3 small scaly hairy staminodia at the base of the corolla.



FIG. 9.—The corolla of *Barleria micans* split open, showing the stamens.

VERBENACEÆ

Lantana camara L. Sp. Pl. ed. 2. ii. 874 (1763). Found only in poor condition. Manzanillo, December 1 to 31, 1890. No. 1059.

The drupes are called "Moro," and are sometimes eaten.

Lantana involucrata L. Amen. Acad. iv. 319 (1759). Common along river banks. Colima, February 27 and 28, 1891. No. 1303.

Lippia sp. Colima, January 9 to February 6, 1891. No. 1199.

Bouchea dissecta Watson, Proc. Amer. Acad. xxiv. 68 (1889). Agiabampo, October 1 to 15, 1890. Letter B.

Priva echinata Juss. Ann. Mus. Par. vii. 69 (1806). A few specimens obtained from the mountains. Manzanillo, December 1 to 31, 1890. No. 1007, and also No. 1093, which is infested by peculiar gall-insects.

Verbena polystachya H. B. K. Nov. Gen. et Spec. ii. 274 (1817). Very common on grassy plains. Colima, January 9 to February 6, 1891. No. 1156.

Citharexylum sp. Colima, February 27 and 28, 1891. No. 1326.

LABIATÆ.

Hyptis capitata Jacq. Coll. i. 102 (1786). Along river bottoms. Colima, January 9 to February 6, 1891. No. 1174.

Hyptis stellulata Benth. Lab. Gen. et Spec. 129 (1833). Three to five feet high, Along the river bottom. Colima, January 9 to February 6, 1891. No. 1203,

Hyptis pectinata (L.) Poit. Ann. Mus. Par. vii. 474, t. 30 (1806); *Nepe'ta pectinata* L. Sp. Pl. ed. 2. ii. 799 (1763). Found at the base of the mountains. Manzanillo, December 1 to 31, 1890. No. 993.

Hyptis polystachya H. B. K. Nov. Gen. et Spec. ii. 321 (1817). Colima, January 9 to February 6, 1891. No. 1134.

Hyptis suaveolens (L.) Poit. Ann. Mus. Par. vii. 472, t. 29, f. 2 (1806); *Ballota suaveolens* L. Syst. ed. 10. ii. 1100 (1759). Manzanillo, December 1 to 31, 1890. No. 913.

The seed is called "Chana" at Colima and Manzanillo, but elsewhere it is known as "Chia granda." The "Chia" proper is the fruit of a *Salvia*. This species is collected in considerable quantities and sold in the markets under the above names. With sweetened water it makes a cool, refreshing drink, much used by the sick. The roots are also gathered and used medicinally.

Draccocephalum moldavica L. Sp. Pl. ii. 595 (1753). Flowers white. Colima, January 9 to February 6, 1891. No. 1225.

This is a medical plant much used by the Mexicans and sold in the market at Colima. It is probably cultivated in the gardens, but it was not seen by Dr. Palmer in any of his excursions.

The specimen from southern Mexico, doubtfully referred by Mr. Hemsley to *D. parviflorum*, could hardly be confused with this species.

NYCTAGINACEÆ.

Boerhavia erecta L. Sp. Pl. i. 3 (1753). Common plant growing in sand along the beach and margins of the lagoons. Manzanillo, December 1 to 31, 1890. No. 907.

Boerhavia erecta L. form (?). Stems purplish: "flowers white;" stamens 3. On sandy plains. Agiabampo, October 3 to 15, 1890. No. 758.

Boldoa lanceolata Lag. Gen. et Spec. Nov. 10 (1816). Colima, January 9 to February 6, 1891. No. 1204.

Pisonia aculeata* L. Sp. Pl. ed. 2. ii. 1511 (1763). Colima, January 9 to February 6, 1891. Nos. 1114 and 1115.

Mr. Watson says of it in a letter dated October 23, 1891. "That must be *Pisonia aculeata*. We have seen the same thing essentially from the West Indies and Brazil, and the variety *hirsutissima* is described as having the cymes corymbose-capitate."

Cryptocarpus globosus H. B. K. Nov. Gen. et Spec. ii. 187, t. 123 (1817). Bushy plant, 4 feet high: largest leaves 12 inches long, including the long petioles: flowers dull white, perianth pubescent, with granular and hooked hairs: stamens 3: style lateral. Manzanillo, December 1 to 31, 1890. No. 950.

I have not seen specimens of *C. globosus*. My specimens differ from the description of that species in having only 3 stamens and much larger leaves.

* *Pisonia aculeata* L. Guaymas, April 1 and 2, 1891. No. 175a. Specimens of this plant are again collected by Dr. Palmer. The following note was sent me by the late Dr. Watson:

"*Cryptocarpus* (?) *capitatus* Watson [Proc. Amer. Acad. xxiv. 71 (1889)]. Fresh specimens of this doubtfully named species, collected by Dr. Palmer at Guaymas, show it to be a form of the widely-distributed and very variable *Pisonia aculeata*. It does not differ essentially from the var. *hirsutissima* Schmidt. Fl. Bras. xiv. 354, distinguished by its blunt obovate leaves and dense, short-hirsute pubescence. The want of spines (they are few on these specimens also), the unusual form of the leaves, and the presence of only staminate flowers served to effectually disguise Dr. Palmer's original specimens."—S. W.

AMARANTACEÆ.

Celosia (?) monosperma Rose, sp. nov. Shrub, 8 to 16 feet high, glabrous: leaves lanceolate 3 to 6 inches long, acute or shortly acuminate, cuneate at base; panicles terminal large, often 1 foot long, slightly pubescent: bracts and bractlets ovate, acute, $\frac{1}{2}$ line long: segments of the perianth oblong, 1 line long, acute: stamens 5, united at base into a shallow membranaceous cup; anthers 2-celled; intermediate appendages none: styles none: stigmas 2, reflexed, acute: utricles stipitate, ovoid, compressed, circumscissile, shorter than the perianth: ovule 1, suspended from an elongated funiculus: seed pendulous, lenticular, shining; aril none.—Very common on the mountains near Manzanillo, December 1 to 31, 1891. No. 887.

The following note has been sent me by Dr. Hans Schinz in regard to this species:

"I have to thank you very much for having sent me the very interesting *Amarantaceæ*. No doubt your *Celosia monosperma* is a very interesting and puzzling plant, but I also take it for a *Celosia*. Unfortunately, most of the flowers are destroyed by a little beetle, so that I could not make out for sure if the anthers are 2-celled or 1-celled, but as you say in your description that they are 2-celled it can not be anything else than a *Celosia*. The *Celosia monosperma* does not stand alone, for the different species that were formerly united under the name *Lagrezia* generally have but one or two seeds."

Celosia moquini Guillem. in DC. Prod. xiii. pt. 2. 239 (1849). An upright plant, 4 to 8 feet high: utricles circumscissile: ovules 2. Along fences in river bottoms. Colima, January 9 to February 6, 1891. No. 1208.

This plant is referred as above, although I have not seen other specimens of the species.

Very little is known of this species. It was probably collected by Bonpland, and is No. 354 of Ghiesbreght. The localities from which these collectors obtained the plant is not known. Perhaps Ghiesbreght obtained his specimens from near this locality. He seems to have visited Colima, although I find very few species of this region credited to him. A type specimen is said to be in Herb. Mus. Paris.

Moquin was uncertain whether the utricles were circumscissile or not. My specimens, while not quite mature, clearly show that the utricles are circumscissile.

Chamissoa altissima (Jacq.) H. B. K. Nov. Gen. et Spec. ii. 197, t. 125 (1817); *Achyranthes altissima* Jacq. Enum. Pl. Carib. 17 (1760). Common along the base of the mountains and near the lagoon. Manzanillo, December 1 to 31, 1890. No. 1023.

Amarantus sp. Sepals 5: stamens 5: stigmas 3. Manzanillo, December 1 to 31, 1890. No. 1000.

This seems to be a common species, but it does not agree with any represented in the National Herbarium.

Acnida cannabina L. Sp. Pl. ii. 1027 (1753). Stems 2 feet high. Grows along the edge of the lagoon. Manzanillo, March 2 to 18, 1891. No. 1399.

Only the staminate form of this species was obtained and it can not be definitely referred here. So far as I can learn, neither this species nor any other *Acnida* has been reported from Mexico.

Achyranthes aspera L. Sp. Pl. i. 204 (1753). Common along the base of the mountain and about the lagoon. Manzanillo, December 1 to 31, 1890. No. 1032.

Telanthera gracilis (?) Moq. in DC. Prod. xiii. pt. 2. 375 (1849). Shrubby, 5 to 8 feet high: leaves lanceolate, long-acuminate, tapering at base into a short petiole, glabrous or nearly so, 3 to 7 inches long, 1 to 2 inches wide: inflorescence irregularly trichotomously branched or in umbellate clusters of 3 to 5 rays: heads small, white, either on short pedicels or in glomerate clusters: calyx 5-parted, $2\frac{1}{2}$ lines long, nerveless, long-pilose on the back; stigmas capitate. Common in the mountains. Manzanillo, December 1 to 31, 1890. No. 886.

I have referred my plant as above without having seen any specimens of that species. It differs from the description in some slight details and it has not been collected so far north before.

The foliage is rather coarse, but Dr. Palmer writes that the white flowers are very attractive and he thinks it would be a good plant for ornamental cultivation.

Gomphrena decipiens Watson, Proc. Amer. Acad. xxi. 437 (1886). In bottom lands.

Gomphrena decumbens Jacq. Hort. Schoenbr. t. 482 (1804). Manzanillo, December 1 to 31, 1890. No. 911. Agiabampo, October 3 to 15, 1890. No. 793.

Frœlichia sp. Leaves oblong to oval, 1 to 2 inches long, obtuse or acutish: fruiting calyx flattened, 2-winged. Colima, January 9 to February 6, 1891. No. 1133.

This species belongs to the section containing *F. tomentosa* and *F. alata*, and is very near the latter, but the leaves are somewhat different.

Iresine interrupta Benth. Bot. Voy. Sulph. 156 (1844). Large leaves ovate, 6 to 8 inches long, including the petiole; flowers pistillate. Manzanillo, December 1 to 31, 1890. No. 1074.

Other specimens, with similar leaves, but with smaller heads, were collected, which are provisionally referred here. No. 932. The staminate plant was found very common about Colima, along streams. January 9 to February 6, 1891. No. 1211.

To this species, apparently, should have been referred Palmer's No. 389, from Alamos.

Iresine celosioides L. Sp. Pl. ed. 2. ii. 1456 (1763). Common along river bottoms. Colima, January 9 to February 6, 1891. No. 1206.

PHYTOLACCACEÆ.

Rivina humilis L. Sp. Pl. i. 121 (1753). The typical form. Agiabampo, October 3 to 15, 1890. No. 782. Also the pubescent form. About Manzanillo, December 1 to 31, 1890. No. 1031.

I find no character except the pubescence to distinguish these specimens, and it appears very doubtful whether there should be two species recognized, as some botanists hold.

Petiveria alliacea L. Sp. Pl. ed. 2. i. 486 (1762). Manzanillo, December 1 to 31, 1890. No. 942.

Stegnosperma halimifolia Benth. Bot. Voy. Sulph. 17, t. 12 (1844). Armeria, February 15, 1891. No. 1280.

POLYGONACEÆ.

Coccoloba sp. A small tree, 30 feet high, with large top: leaves coriaceous, oblong to broadly obovate, 4 to 6 inches long, $2\frac{1}{2}$ to $3\frac{1}{2}$ inches broad, rounded at apex, oblique and more or less tapering at base, glabrous on both sides, with veins rather prominent beneath; petioles 6 to 9 lines long; sheaths 3 to 4 lines long, truncate, glabrous, very tardily deciduous: spikes single, 6 to 10 inches long: perianth 5-parted: stamens 8: fruit sessile, solitary in the axils of the bracts, somewhat fleshy when mature, ovate, 4 to 5 lines long. Manzanillo, March 2 to 18, 1891. Letter G.

Collected in flower by Marcus E. Jones at Manzanillo, June 25, 1891. No. 5. This seems to be an unnamed species.

Coccoloba sp. Diffuse shrub, 5 to 8 feet high, glabrous or the younger parts puberulent: leaves thinnish, oblong, 3 to 4 inches long, rounded at apex, oblique at base, reticulated and puberulent: petiole 2 to 3 lines long: sheath 2-lobed, puberulent: racemes slender, single or somewhat branching, 4 to 8 inches long: pedicels 1 to 2 lines long: fruits small, "red". Rare. On the mountain sides. Manzanillo, December 1 to 31, 1890. No. 965.

These two species are very similar, but the former may be distinguished from the latter by its larger, thicker, glabrous leaves and sessile fruit.

Antigonon flavescens Watson, Proc. Amer. Acad. xxii. 446 (1887). A very common climber found running over bushes and trees in various parts of the mountains. Manzanillo, December 1 to 31, 1890. No. 980.

ARISTOLOCHIACEÆ.

Aristolochia pardina Duch. Ann. Sci. Nat. ser. 4. ii. 47 (1854). A high-climbing shrub; the woody base $\frac{1}{2}$ inch in diameter, the bark corky; the herbaceous branches glabrous or a little glaucous (except the margins, petioles, and axils of young leaves, these pubescent): leaves orbicular to broadly ovate with broad cleft, open or closed sinus, 5-nerved, somewhat reticulated, obtuse or retuse; flowers solitary, axillary, on slender peduncles $1\frac{1}{2}$ to $3\frac{1}{2}$ inches long: calyx "old gold, spotted with brown," oval, 4 to 5 lines in diameter; tube 9 lines long, obtuse or acutish; stamens 6; capsule many-seeded, oblong, 15 to 20 lines long: seeds 3 lines long. Colima, January 9 to February 6, 1891. No. 1247.

Very common in shade on hillside and river bottoms, climbing over bushes, trees, and fences.

The leaves are not as large as described by Duchartre.

I have not seen specimens of this species, but it has been collected about Colima by Ghiesbreght and Dugès. The species is only known from this locality. Mr. Hemsley thinks that this is the *Guaco mexicana* Liebm.

PIPERACEÆ.

Piper palmeri C. DC. sp. nov.; foliis modice petiolatis ovato-lanceolatis basi inæquali latere longiore rotundatis brevioribus apice acute acuminatis utrinque et subtus densius velutino-pubescentibus haud scabris, nervo centrali nervos adscendentes alternos utrinque 5 mittente, petiolo dense pubescente, basi vaginante, pedunculo petiolum æquante dense retrorsum pubescente, amento limbi dimidium superante in sicco flavescente, rhachi inter baccas fimbriolata, bractee pelta triangulari margine in sicco flavida hirsuta pedicello angusto hirsuto, bacca obpyramidato-trigona vertice carnosâ puberulaque. In Colima ubi Natico dictum, Januarii florens (Palmer n. 1227). Frutex 6 ped. altus ramulis retrorsum pubescentibus amentiferis 2 mm. crassis in sicco virescentibus, ramis glabris ligno duro. Limbi in sicco membranacei pallidi virescentes subopaci haud crebre pellucido-punctulati, ad 15 cm. longi ad $5\frac{1}{2}$ cm. lati. Petioli ad 1 cm. longi. Amenta apice obtusa, baccifera in sicco ad 4 mm. crassa. Stamina 4 antheris subglobosis parvis caducis. Bacca circiter 1 mm. longa. Stigmata 3 sessilia breviter.

Species *Piper pseudo-fulginci* C. DC. (in Linnaea) proxima, limbis haud subobovatis nervorum numero minore amentisque haud apice mucronulatis ab eo sat discrepans.

Var. ***manzanilloanum*** C. DC. var. nov.; ramulis pubescentibus limbis tenuioribus amentis in sicco haud aut minus flavescentsibus baccisque paulo minoribus a specie vix distinctum. Manzanillo, December 1 to 31, 1890. No. 1045.

Piper unguiculatum longifolium C. DC. var. nov.; limbis ad $10\frac{1}{2}$ cm. longis baccis densius et longius hirtellis.

In Colima, ubi commune. Palmer n. 1120.

Piper umbellatum L. Sp. Pl. ed. 2. i. 43 (1762). Colima, January 9 to February 6, 1891. No. 1226.

Piper tuberculatum Jacq. Ic. Par. ii. 2, t. 211 (1786-'93). Colima, January 9 to February 6, 1891. No. 1213.

Piper realejoanum C. DC. Linnaea, xxxvii. 345 (1871-'73). Manzanillo, March 2 to 18, 1891. Nos. 1374 and 1332.

LAURACEÆ.

Sassafridium macrophyllum Rose, sp. nov. A diffuse shrub with numerous stems, 15 feet high: leaves alternate, oblong, 6 to 10 inches long, 1 to 3 inches broad, cuneate at base, acuminate, "emerald-green," shining, strongly veined beneath; petioles 3 to 6 lines long: panicles axillary and terminal, 4 to 8 inches long, including the peduncle; pedicels 3 to 5 lines long: flowers white, sweet-scented, 5 to 6 lines in diameter: calyx 6-parted, the outer considerably larger: perfect stamens 9, 4-celled, 4-valved, sessile; the three inner with a pair of glands at base; staminodia 3, capitate.—Very abundant in the wet bottom of a small creek on the opposite side of the bay from Manzanillo, December 1 to 31, 1890. No. 1033.

The only described species is *S. veraguense* from Nicaragua, although there are said to be 2 undescribed species from South America. My species differs from the above in having nearly all the parts much larger, especially the leaves; the latter are also acuminate, with stronger lateral veins, but the veinlets are not so strongly or regularly reticulated.

Meissner, in the original description of the genus (DC. Prod. xv. 171), as well as Benth. and Hook. (Gen. Plant. iii. 160), states that the berry is unknown. Charles Wright, however, collected mature fruit in Nicaragua as long ago as 1853-'56. The berry is oblong, glabrous, 6 to 8 lines long. By some mistake these specimens of Wright's were distributed under the name "*Daphnidium veraguense* Meissn."

Here I am inclined to refer J. N. Rovirosa's Nos. 35 and 15, although they have somewhat smaller leaves, and the No. 35 is said to be a tree 8 to 10 meters high. Rovirosa's specimens are from Tabasco and were collected November 6 and 20, 1887, respectively.

LORANTHACEÆ.

Loranthus sp. A common plant parasitic on *Bumelia*. Colima. January 9 to February 6, 1891. No. 1124.

Phoradendron sp. Manzanillo, December 1 to 31, 1890. No. 982.

EUPHORBIACEÆ.

Pedilanthus sp. Leaves oblong, small, 6 lines long, glabrous: peduncle glabrous: involucre glabrous, crimson, 6 lines long: upper lip small, 2-lobed; spur or appendage slender, 6 lines long: glands 2: glands and pedicels of male flowers glabrous: capsule 1 inch broad, crimson. Abundant in certain places in the rich bottoms. Agiabampo, October 3 to 15, 1890. No. 802.

This species seems near the specimens obtained by Dr. Palmer at Los Angeles Bay in 1887 and referred to *P. macrocarpa* by Mr. Watson. It seems very distinct, however, from that species.

Pedilanthus sp. Shrub, 2 to 3 feet high, glabrous: leaves thick and "leathery" glabrous, oblong to obovate, 3 to 5 inches long, peduncle pubescent: involucre very oblique, puberulent along the margins; 6 lines long: upper lip small, 2-lobed: perianth of 3 squamellæ: spur or appendage very short and obtuse: glands 3 or 4: stamens numerous; pedicels and filament glabrous. Colima, February 27 and 28, 1891. No. 1328.

Euphorbia californica Benth. Bot. Voy. Sulph. 49, t. 23B (1844). A tree-like shrub with trunk 6 feet high and with a very large top. Agiabampo, October 3 to 15, 1890. No. 756.

As first suggested by Mr. Watson, this species seems to include *E. hindsiana*, and with it also I am inclined to place the more recent species *E. comoduana* Millsp.

As the species is now construed its range extends in Mexico along the coast from Guaymas to Agiabampo and on both sides of the peninsula of Lower California as far north as Comondú. The bibliography of this species is as follows:

Boissier in DC. Prod. xv. pt. 2. 68; Watson, Proc. Amer. Acad. xxiv. 76; Zöe, i. 348; Brandg. Proc. Cal. Acad. ser. 2. iii. 170.

E. hindsiana Benth. Bot. Sulph. 51, t. 24; Boissier in DC. Prod. xv. pt. 2. 68; Millsp. Proc. Cal. Acad. ser. 2. ii. 229; Zöe, i. 348.

E. comonduanana. Millsp. Proc. Cal. Acad. ser. 2. ii. 229; Contr. Nat. Herb. i. 77; Brandg. Proc. Cal. Acad. ser. 2. iii. 170.

Euphorbia capitellata laxiflora Watson, Proc. Amer. Acad. xxiv. 74 (1889). In shade along a creek bottom. Agiabampo, October 3 to 15, 1890. No. 762.

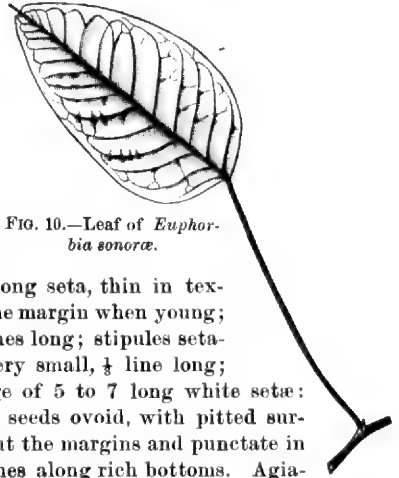
Euphorbia (Cytтарospermum) colimæ Rose, sp. nov. Slender, weak annuals, 1 to 2 feet high, villose or glabrate: leaves alternate below, opposite above, ovate to lanceolate, slightly narrowed at base, acute, bract-like above; bracts small, with white or whitish margins: involucre about 1 line long: glands 5 with an entire petaloid, white appendage; lobes broad, obtuse, with a pectinate margin: styles 2-parted: capsule, glabrous: seeds with smaller pits, pectinate-margined.—In gardens and fields, growing in shade. Colima, January 9 to February 6, 1891. No. 1170.

Euphorbia pilulifera L. Sp. Pl. i. 454 (1753). Common between the mountains and beach. Manzanillo, December 1 to 31, 1891. No. 938.

Euphorbia (Cytтарospermum) sonora

Rose, sp. nov. Annual, slender, erect, glabrous, 1 to 3 feet high: leaves oblong, $1\frac{1}{2}$ inches long or less, rounded at base, obtuse or acutish, tipped with a long seta, thin in texture, slightly pubescent and ciliate on the margin when young; petiole longer than the blade, 1 to 2 inches long; stipules setaceous, deciduous; involucre solitary, very small, $\frac{1}{4}$ line long; glands (1 smaller) 5, with an appendage of 5 to 7 long white setæ: styles 3, entire; carpels slightly villose: seeds ovoid, with pitted surface; pits with glandular tubercles about the margins and punctate in the center.—In the dense shade of bushes along rich bottoms. Agiabampo, October 3 to 15, 1890. No. 760.

FIG. 10.—Leaf of *Euphorbia sonora*.



Euphorbia thymifolia L. Sp. Pl. i. 454 (1753). Common in level places between the mountains and the beach. Manzanillo, December 1 to 31, 1890. No. 939.

This species, although of wide distribution, is scarce in our herbarium.

Euphorbia sp. In shade along a creek bottom. Agiabampo, October 3 to 15, 1890. No. 761.

Euphorbia sp. Plains and river banks. Colima, January 9 to February 6, 1891. No. 1191.

Euphorbia sp. Along river bottoms. Manzanillo, December 1 to 31, 1890. No. 924.

Euphorbia sp. Manzanillo, December 1 to 31, 1890. No. 943.

Euphorbia sp. Manzanillo, December 1 to 31, 1890. No. 899.

Euphorbia sp. Manzanillo, March 2 to 18, 1891. No. 1351.

Euphorbia sp. Manzanillo, December 1 to 31, 1890. No. 1038.

Phyllanthus polygonoides Nutt. in Spreng. Syst. Veg. iii. 23 (1825). In rich bottoms. Agiabampo, October 3 to 15, 1890. No. 767.

Phyllanthus niruri L. Sp. Pl. ed. 2. ii. 1392 (1763). Very common about the lagoon in moist places. Manzanillo, December 1 to 31, 1890. No. 925.

Jatropha cordata Muell. Arg. in DC. Prod. xv. pt. 2. 1078 (1866). Agiabampo, October 3 to 15, 1890. Letter A. Only collected in flower at this place. It was obtained in fruit at Alamos (No. 667), but not reported upon in that list.

Jatropha (Adenoropium) purpurea Rose, sp. nov. A bush with several stems, monoëcious, glabrous throughout: leaves small, 1 to 2 inches long, 3-lobed, more or less toothed and often bearing short glandular setæ, truncate at base: petiole about the length of the blade: stipules (and bracts) lacerate, cut into glandular setæ: inflorescence a small corymb: male flowers with calyx deeply 5-parted; lobes oblong, obtuse, 2 lines long; 2 sepals nearly entire, the other 3 glandular-setose; petals 5, oblong, 4 lines long, obtuse, brown or "cherry color," free or slightly cohering near the base, glabrous; glands 5; stamens 11, connate to the anthers, glabrous: female flowers with calyx and petals similar to male flowers; ovary glabrous; styles 3, thickened and 2-lobed; capsule about 6 lines in diameter, glabrous.—Agiabampo, October 3 to 15, 1890. No. 785.

Croton ciliato-glanduliferus Ortega, Hort. Matr. 51 (1797-1800). Very common in rich bottoms. Agiabampo, October 3 to 15, 1890. No. 798.

Croton sp. Manzanillo, December 1 to 31, 1890. No. 888.

Croton sp. Manzanillo, December 1 to 31, 1890. Nos. 977 and 968.

Croton sp. Manzanillo, December 1 to 31, 1890. No. 1058.

Argythamnia manzanilloana Rose, sp. nov. Monoëcious; branches slender, angled: leaves lanceolate, entire or slightly toothed, 2 inches long or less, pubescent on both sides, strongly nerved beneath, 2 inches or less long: flowers in small glomerules in the axils of the leaves; pistillate flowers, mostly 1; sepals 5, linear, acute, a little longer than the fruiting capsule; petals persistent, shorter than the sepals: seed reticulate-nerved: staminate flowers with calyx and corolla similar to pistillate flowers; stamens 10, in 2 series, the inner 5 longer.—Under shade of bushes along the lagoon. Manzanillo, December 1 to 31, 1890. No. 1073.

This species resembles *A. palmeri*, but has stronger-veined leaves, smaller calyx and carpels, and very different seeds.

Manihot angustiloba (Torr.) Muell. Arg. in DC. Prod. xv. pt. 2. 1073 (1866); *Janipha manihot angustiloba* Torr. Mex. Bound. Surv. 199 (1859). Manzanillo, December 1 to 31, 1890. No. 1027a.

Acalypha coryloides Rose, sp. nov. Shrub, 4 to 6 feet high, with grayish bark; young branches puberulent: leaves alternate, oblong, acute, 5-nerved at base, serrate, 3 to 4 inches long; petioles short, 3 to 4 lines long: staminate flowers in axillary catkins (3 to 6 lines long), 2 to 3 in the axil of each bract; subtending bract ovate, rounded at apex, hairy on the margin, scaly; lateral bracts 2, setaceous; pedicels short, but distinct; sepals 4; stamens 8; anthers 2-celled; cells distinct and reflexed; pistillate flowers solitary or in pairs in the axils of young leaves: pedicel (peduncle) slender, 6 to 12 lines long, 1- to 2-bracteate near the center; sepals 5; ovary 3-lobed, 3-celled, 3-seeded, muricate; styles lacerate.—Manzanillo, December 1 to 31, 1890. No. 1368. December 30, 1891. No. 1811.

This is a very peculiar *Acalypha*. It differs from all other species which I have seen in its staminal spikes being aments or catkins. They appear as scaly buds and seem to have been formed at the close of the last growing season. The flowers seem to develop just before the leaves appear. The position of this species in the genus is doubtful; it is perhaps near *A. longipes*, which has similar pedicels and ovaries in the female flowers, but the latter has the flowers arranged in panicles.

The plant has much the habit of the hazelnut, and hence the specific name.

The following note is taken from F. Pax's letter of December 28, 1892:

"Indeed, it is a very peculiar plant, not allied with any other species of *Acalypha*. There is no doubt that the plant shows the greatest affinity with the genus *Acalypha*: the flowers are identical with those of *Acalypha*, but the inflorescence is very unlike. I do not know any other species of *Acalypha*

which has any affinity with your new plant, and I think it is best to place it in a new subgenus."

Acalypha microphylla Klotzsch in Seem. Bot. Voy. Herald, 278 (1856). Common along the base of the mountain, and about the lagoon. Manzanillo, December 1 to 31, 1890. No. 935. Also collected from a garden at Colima, January 9 to February 6, 1891. No. 1251.

This same species was collected at Mazatlan in 1888 and was referred as above by Dr. B. L. Robinson.

Acalypha papillosa Rose, sp. nov. Diffuse shrub, 5 to 6 feet high, monœcious: leaves ovate, long acuminate, rounded or slightly cordate at base, sharply dentate, 3- to 5-nerved, pubescent when young, becoming glabrate in age; blade 2 to 4 inches long, 1 to 2 inches broad; petiole 6 to 10 lines long; stipules setaceous, early deciduous: fertile spikes terminal, few-flowered; bract cup-shaped, 7-toothed, 1-flowered: calyx lobes 4: styles long, purple, each with 8 to 10 branches: capsules hispid, papillose roughened: sterile spikes axillary, dense; calyx-lobes 4.—Along creeks. Agiabampo, October 3 to 15, 1890. No. 778.

Probably nearest the recent species *A. flavescens* Watson.

Acalypha subviscida Watson, Proc. Amer. Acad. xxi. 440 (1886). Manzanillo, December 1 to 31, 1890. No. 941.

URTICACEÆ.

Ficus fasciculata Watson, Proc. Amer. Acad. xxiv. 78 (1889). A tree, 30 feet high, bearing a widely spreading top; trunk 2 feet in diameter: leaves often 5 inches long on petioles 1 inch long. Colima, January 9 to February 6, 1891. No. 1119.

This seems to be the same as Mr. Watson's species although the leaves are considerably larger. Mr. Watson afterwards thought that his species was possibly referable to *F. sapida*.

This wild fig is called "Camichin." The fruit, which is small, is sweet and juicy, and is much used by the people of this region.

Ficus sp. Tree, 20 feet high with trunk 1 foot in diameter, and bearing a widely spreading top; branchlets pubescent, especially on the stipular lines: leaves oblong, 3 to 5 inches long, 2 to 2½ inches broad (on petioles 9 to 20 lines long) obtuse, rounded at base, pinnately veined: fruit sessile, in pairs, small, 3 lines in diameter: involucre 3- to 4-lobed; lobes obtuse, puberulent. At the base of the mountains growing among the rocks. Manzanillo, March 2 to 18, 1891. No. 1387. Pringle's No. 3887 (1891), from Barranca, near Guadalajara, is the same plant. It was distributed as *F. tecolutensis*, from which it differs in its smaller, sessile fruit, 3- to 4-lobed involucre, pubescent stems, etc. It is, perhaps, a new species.

Ficus sp. Small shrub, 6 feet high: leaves ½ to 6 inches long, acuminate, cuneate at base, somewhat pubescent beneath. Colima, February 27 and 28, 1891. No. 1324.

Ficus sp. Leaves oblong, 10 inches long on petioles 2 inches long. Colima, January 9 to February 6, 1891. No. 1186.

SALICACEÆ.

Salix taxifolia H. B. K. Nov. Gen. et Spec. ii. 22 (1817); Anders in DC. Prod. xvi. pt. 2. 215; *S. microphylla* Cham. & Schlecht. Linnaea, vi. 354; Hook & Arn. Bot. Beech. Voy. 311, t. 70, *file* M. S. Bebb. Shrub, 4 feet high. Along a river bank. Colima, January 9 to February 6, 1891. No. 1193.

ORCHIDACEÆ.

Epidendrum (Barkeria) palmeri Rolfe, Kew Bull. 1893, 6 (1893); pseudobulbis fusiformibus di-triphyllis, foliis linearibus v. lineari-lanceolatis acutis, pedun-

culis terminalibus, racemis simplex v. interdum ramosis multifloris, bracteis lanceolatis acuminatis, pedicellis gracilibus, sepalis lineari-lanceolatis acuminatis, petalis lanceolatis acutis, labello suborbiculari-elliptico obtuso irregulariter crenulato, carinis 3 approximatis parallelibus crenulato-papillosis, nervis lateralibus basi elevatis crenulato-papillosis, columna brevi clinandrio late alato.

Hab. Colima; January–February, 1891, n. 1201!

Pseudobulbi 1–3 poll. longi. Folia $1\frac{1}{2}$ – $2\frac{1}{2}$ poll. longa. Pedunculi $\frac{1}{2}$ –1 ped. longi. Bractee $1\frac{1}{2}$ –3 lin. longae. Pedicelli 5–8 lin. longi. Sepala 7 lin. longa, $1\frac{1}{2}$ lin. lata. Petala 7 lin. longa, 2 lin. lata. Labellum 7 lin. longum, $5\frac{1}{2}$ lin. latum. Columna 1 lin. longa.

A very distinct *Epidendrum*, belonging to the section *Barkeria*, readily distinguished from every other by its narrow leaves, small bracts, and smaller flowers, which are densely arranged on the raceme, and appear to be light-rosy purple in color. A dried specimen collected by Dr. Edward Palmer, at Colima, in Mexico, was sent for determination by Mr. J. N. Rose, assistant botanist, Department of Agriculture, Washington, U. S. A., in November, 1892.

The above description and note are taken from Kew Bulletin of Miscellaneous Information, for January, 1893, p. 6.

BROMELIACEÆ.

Hechtia sp. Along the ocean just above high tide and extending back to the base of the mountains. Manzanillo, March 2 to 18, 1891. No. 1352.

Probably near *H. rosea*. Another plant which may belong to this genus was obtained from the market at Colima, but it is in too poor condition to determine accurately. No. 1410.

Tillandsia recurvata L. Sp. Pl. ed. 2. i. 410 (1762), *fide* J. G. Baker. Agiabampo, October 3 to 15, 1890. No. 806.

Tillandsia polystachya L. Sp. Pl. ed. 2. i. 410 (1762), *fide* J. G. Baker. Agiabampo, October 3 to 15, 1890. No. 805.

AMARYLLIDACEÆ.

Hymenocallis sp. Scape strongly compressed, 12 to 15 inches high: leaves (appearing with the flowers), about 6, 10 to 20 inches long by 10 to 14 lines broad, glaucous: scape 3- to 6-flowered; spathe 2-leaved; bracts ovate, membranaceous, 2 inches long: perianth tube 4 to 5 inches long, green; lobes $2\frac{1}{2}$ to $3\frac{1}{2}$ inches long, linear, white: staminal cup funnel form, 10 lines long, 10 lines broad at the throat; free tips of filament green, 15 lines long; style slender, green, a little longer than the stamens; cells with 2 ovules. Probably collected near Agiabampo, October 8 to 15, 1890. No number.

Only bulbs were collected by Dr. Palmer. I had these planted and two specimens flowered during the summer of 1891; none flowered during 1892, and only a single specimen flowered during 1893. It is a very delicate little plant and well worthy of cultivation.

This species is near *H. harrisiana*, but the leaves are glaucous, and not nearly so wide, of different shape, and with different tip.

Agave (Littæa) angustissima Engelm. Trans. St. Louis Acad. iii. 306 (1875). Acaulescent: leaves 15 to 20 in a dense rosette, straight, linear, 12 to 20 inches long, 4 to 5 lines broad above the inflated base, flat on both sides; the edge splitting off in fine threads; the end spine slightly pungent: peduncle 12 feet long including the dense spikes: flowers in pairs: corolla yellow; tubeslender, cylindrical, 8 to 9 lines long; lobes linear, 6 lines long: stamens purple; filaments more than twice as long as lobes; anthers becoming curved and forming almost a complete circle: fruiting peduncle very short or none in the axil of a long, setaceous bract (1 to 2 inches long): pedicels 1 to 2 lines long: capsule glabrous,

9 to 10 lines long. Growing among rocks with little soil, along the margin of the bay at Manzanillo, December 1 to 31, 1890. No. 1070.

I have given a full description above, as the original reference is very incomplete.

The following note appeared in *Garden and Forest* of January 4, 1893:

"It will be of considerable interest to the readers of *Garden and Forest* to know that Dr. Edward Palmer has collected what seems to be the little-known *Agave angustissima* (see figure 11). The plant is entirely unknown to the growers of *Agaves*, and is only represented in herbaria by the type specimens in the Engelmann Herbarium at the Shaw School of Botany, St. Louis.

"The following note from Dr. Engelmann, published in the Transactions of the Academy of Sciences, St. Louis (vol. iii, p. 306), contained all the information that we previously had respecting this plant:

"Dr. Gregg collected near Ocotillo, direction of Tepic, in western Mexico, leaves of a plant which he says bears a scape 5 to 6 feet high, and which, like many narrow-leaved *Agaves* and *Yuccas*, was called "Pamilla" by the natives; unfortunately no flowers came along, but as it seems to be an undescribed *Agave*, it may be designated as *A. angustissima*; leaves 2 to 3 feet long, 2 and 1½ lines wide, convex on the back, filamentose on the margin, narrowed into a short (2½ lines), stout, triangular, brown spine. It seems allied to *A. filamentosa* Salme., which, however, has much shorter and wider leaves. The form of the terminal spine precludes its being taken for a *Yucca*."

"Dr. Palmer's plant reaches 12 feet in height. The leaves are numerous in a dense rosette, the flowers, in pairs, as in *A. schottii*, yellow, with linear lobes. I submitted this species to Mr. J. G. Baker, of Kew, as probably a new species, who wrote me as follows: 'We have nothing like this either in the herbarium or the garden; its nearest affinity is evidently the imperfectly described *A. angustissima*, of which we have no specimens.'

"With this suggestion I applied to Dr. William Trelease for the loan of Engelmann's plant. Through his kindness I have been able to examine the type of this species. I have little hesitancy in referring my specimens here. The type specimens, however, consist of only a few leaves cut off above the enlarged base. With such material any comparison is very unsatisfactory, but until specimens can be obtained from the original station, and it is proved to be different, this plant should stand for *A. angustissima*.

"Dr. Palmer's plant was collected at Manzanillo, December 1 to 31, 1890 (No. 1070). The plant is common, growing among rocks, with little soil, along the margin of the bay. I have some small plants growing in the greenhouses of the Department of Agriculture.

"Seeds when planted in pans, germinated in seven to ten days. Seeds have been sent to Kew and to the Shaw gardens, but no report has yet been received."

Mr. W. Watson, of Kew, also writing in *Garden and Forest* (vol. vi. p. 76) has this to say regarding this discovery:

"The picture and full account of this *Agave*, published in *Garden and Forest* (vol. vi. p. 5), were highly interesting to growers of succulent plants in this country, and still more interesting is the fact that, through the kindness of Prof. Sargent, who sent seeds of it to Kew, it is likely soon to become known in collections here, the seeds having germinated quickly and freely. The offer of seeds through your pages (vol. vi. p. 6) to any person wishing to grow this plant should be taken advantage of by all cultivators of such species of agave as *A. filifera* and *A. schottii*, to which ornamental and compact growers *A. angustissima* is closely related. The attention of collectors and botanists generally should be drawn to the forethought and good nature which attended the rediscovery of this plant. It is difficult to interest botanical collectors in the introduction of desirable plants into cultivation."

DIOSCOREACEÆ.

Dioscorea macrostachya Benth. Pl. Hartw. 73 (1841). Flowers staminate. Only a single plant seen, in shady woods. Manzanillo, March 2 to 18, 1891. No. 1329.

COMMELINACEÆ.

Athyrocarpus leiocarpus (Benth.) Benth. & Hook. in Hemsl. Biol. Cent.-Amer. iii. 386 (1885); *Commelina leiocarpa* Benth. Bot. Voy. Sulph. 176 (1844). A weak vine climbing over low bushes. Colima, January 9 to February 6, 1891. No. 1147.

Commelina virginica L. Sp. Pl. ed. 2. i. 61 (1762). Manzanillo, December 1 to 31, 1890. No. 919.

PALMACEÆ.

Cocos (?) sp. A tree, sometimes 100 feet high, 12 to 18 inches in diameter: leaves large and pinnate: sepals and petals 3 each, about equal, broadly ovate, 1 inch long: disk prominent: fruit oblong, 2 inches long; the husk thin: the wall of the nut is thick and hard; embryo nearly filling the cavity. Across the bay from Manzanillo, December 1 to 31, 1890. No. 1063.

I have not been able to place these specimens satisfactorily, not having them in flower, but they seem to have many of the characters of *Cocos*. The albumen has the taste of the common cocoanut, but it is more oily. The central cavity is almost wanting. The nut is 1-celled and has three eyes near the base.

The nuts are used in making a kind of soap.

It is variously called "coqueto," "Palma de Coquito de aceita," "Coco de aceita." I find this form referred to *Elais melanococca* in Antonio Garcia Cubas' "Mexico, its Trade, Industries, and Resources." It is certainly not that species, if it really belongs to that genus.

A second species of palm was collected at Manzanillo which I have not been able to determine generically. Six to eight feet high, spiny: leaves palmate; fruit $\frac{1}{2}$ inch in diameter in small, dense clusters: flowers unknown. In low places. Rare. Manzanillo, December 1 to 31, 1890. No. 964.

ARACEÆ.

Pistia stratiotes L. Sp. Pl. ii. 963 (1753). At the mouth of a creek. Manzanillo, March 2 to 18, 1891. No. 1356.

NAIADACEÆ.

Ruppia maritima L. Sp. Pl. i. 127 (1753). From the lagoon at Manzanillo, December 1 to 31, 1890. Nos. 926 and 1042.

CYPERACEÆ.

Cyperus canus F. & C. Presl, Reliq. Haenk. i. 179 (1830). Three feet or more high; flower white. Grew in large bunches under the shade of bushes upon the river bank. Colima, February 27 and 28, 1891. No. 1304.

"Same as F. Mueller, No. 596." N. L. B.

Cyperus compressus L. Sp. Pl. i. 46 (1753). Found in opening between mountains and on the beach near lagoon. In the shade of other plants. Manzanillo, December 1, to 31, 1890. No. 1081.

- Cyperus fugax** Liebm. Vidensk. Selsk. Skr. ser. 5. ii. 196 (1851). Plentiful under shade of trees and in sandy places at the upper part of the lagoon. Manzanillo, December 1 to 31, 1890. No. 1079.
- Cyperus ligularis** L. Amoen. Acad. v. 391 (1760). Very robust and of a light-green color. Manzanillo, March 2 to 18, 1891. No. 1383.
- Cyperus ottonis** Boeckl. Linnæa, xxxvi. 350 (1869-70). Ex. descr. The plants grow at the edge of the lagoon upon low spots where the water reaches them readily. In front of and over them are Mangrove trees and behind, the contiguous mountains give them shade. Manzanillo, March 2 to 18, 1891. No. 1382. Also found in bunches among rocks just above the spray of the ocean. Manzanillo, December 1 to 31, 1890. No. 1095.
- Cyperus regiomontanus** Britton. Shady spots in the mountains. Manzanillo, December 1 to 31, 1890. No. 1080.
- This is *Mariscus hænkei* Presl. Rel. Haenk. i. 181 (1830). "There is a *Cyperus hænkeanus* Kunth, an altogether different plant; so I propose to name it *Cyperus regiomontanus*. The plant is referred to *C. flavus* by Boeckeler, and Watson followed him; but both Clarke and I can see a good species in it. Clarke and I differ in this, however, that he maintains *Mariscus* as a genus, while I do not so regard it." N. L. Britton.
- Cyperus** sp. Manzanillo, March 2 to 18, 1891. No. 1381.
- "It is a *Cyperus* of the *Dididium* section, but I can not quite match it. It is pretty young." N. L. B.
- Eleocharis geniculata** (L.) R. Br. Prod. 224 (1810); *Scirpus geniculatus* L. Sp. Pl. i. 48 (1753). Only two specimens seen. In a swamp. Colima, January 9 to February 6, 1891. No. 1260.

GRAMINEÆ.*

- Antheophora elegans** Schreb. Besch. Gräs. ii. 105, t. 44 (1810). Near the beach. Manzanillo, December 1 to 31, 1890. No. 1094. Also along a river bank. Colima, January 9 to February 6, 1891. No. 1255.
- Hilaria cenchroides texana** Vasey, Contr. Nat. Herb. i. 53 (1890). Very common on grassy plains. Colima, January 9 to February 6, 1891. No. 1267.
- This is undoubtedly the *Hexarrhena cenchroides* Presl.
- Ægopogon gracilis** Vasey, Bull. Torr. Bot. Club, xiii. 230 (1886). In large patches near river banks. Colima, January 9 to February 6, 1891. No. 1270.
- Arundinella brasiliensis** Raddi. Agrost. Bras. 37 (1823). On a river bank. Colima, January 9 to February 6, 1891. No. 1264.
- Paspalum conjugatum** Berg. Act. Helv. vii. 129 (1772). In low, damp ground. Rare. Colima, January 9 to February 6, 1891. No. 1272.
- Paspalum paniculatum** L. Sp. Pl. ed. 2. i. 81 (1862) Along a ditch. Rare. Colima, January 9 to February 6, 1891. No. 1265.
- Panicum molle** Swartz, Prod. Veg. Ind. Occ. 22 (1788); *Panicum barbinode* Trin. Ic. Pl. iii. 318 (1828-36). Said to be introduced. Manzanillo, December 1 to 31, 1890. No. 1078. Much used as a forage plant.
- Panicum capillaceum** Lam. Encyc. i. 173 (1791). In the mountains and wet bottoms. Manzanillo, December 1 to 31, 1890. No. 1083.
- Panicum divaricatum** L. Amoen. Acad. v. 392 (1760). In the mountains. Manzanillo, December 1 to 31, 1890. No. 1089.
- Panicum myurum** Meyer, Prim. Fl. Esseq. 50 (1818). In wet bottoms. Colima, January 9 to February 6, 1891. No. 1259.
- A good forage plant.

* The determination and critical notes upon the grasses were furnished me in 1891 by the late Dr. George Vasey. It has been found necessary since that time to make some slight changes in the nomenclature.

Panicum (Ptychophyllum) pringlei Vasey, sp. nov. Culms tufted, apparently perennial, 8 to 10 inches high, branching near the base: leaves mostly radical (the upper part of culm naked), about 2 inches long, 2 to 3 lines wide, acute: panicle racemose, 2 to 3 inches long, consisting of 3 to 4 alternate, nearly sessile, 1-sided spikes: spikes mostly $\frac{3}{4}$ to 1 inch long, and containing 12 to 15 spikelets on alternate sides of the flattened rachis, each spikelet with a simple persistent bristle at its base; the bristles rather larger than the spikelets: spikelets conical-oblong, about 2 lines long, acute; first glume $\frac{1}{2}$ as long as spikelet, obtuse, obscurely 3-toothed; second glume 9-nerved, a little shorter than the acute 5-nerved male floral glume which incloses the nearly equal, acute palea, and the 3 stamens; fertile spikelet oblong 3-nerved, with a short, pointed apex. Mexico, Pringle Coll. of 1888, No. 2047, and Coll. of 1889, No. 2423; also from Colima, January 9 to February 6, 1891, No. 1256.

Panicum sanguinale ciliare (Retz.) Vasey, Bull. No. 8. Div. Bot. 23 (1889); *Panicum ciliare* Retz. Obs. Bot. fasc. 6, 16 (1786). In the low ground between the mountains and lagoon. Manzanillo, December 1 to 31, 1890. No. 1083.

This variety differs in its usually smaller size, more prostrate habit, shorter leaves, fewer spikes, and in the strongly ciliate-fringed third glume.

Panicum trichanthum Nees, in Mart. Fl. Bras. ii. 210 (1829). In shady places in gardens. Colima, January 9 to February 6, 1891. No. 1257.

Oplismenus humboldtianus nudicaulis Vasey. This is near *Oplismenus humboldtianus muticus* Fournier, but differs from that by having larger flowers, with longer awns, and the hermaphrodite flower not muticous. Colima, January 9 to February 6, 1891. No. 1258.

Oplismenus setarius (Lam.) Roem. & Schultz, Syst. Veg. ii. 481 (1817); *Panicum setarium* Lam. Encyc. i. 170 (1791). In the wet bottom near the bay. Manzanillo, December 1 to 31, 1890. No. 1090.

Cenchrus echinatus L. Sp. Pl. ii. 1050 (1753). Found sparingly on the mountain sides. Manzanillo, December 1 to 31, 1890. No. 1086.

Pennisetum setosum Rich. in Pers. Syn. i. 72 (1805). Grassy bottoms of a creek. Colima, January 9 to February 6, 1891. No. 1269.

Aristida (Ortachne) manzanilloana Vasey, Contr. Nat. Herb. i. 282 (1893). Apparently annual; culms tufted, 2 to 2 $\frac{1}{2}$ feet high, smooth, slender, erect, simple, or geniculate and branching below; leaves 2 to 3 inches long, plane below, conduplicate above, not rigid, very narrow, almost setaceous; sheaths shorter than the blade; panicle racemose, simple, 4 to 5 inches long; branches single, or 2 or 3 together, the lower about 1 inch long, sessile, with 3 to 5 somewhat crowded spikelets; empty glumes about 3 lines long, awn-pointed, nearly equal; floral glume with the undivided awn about 1 inch long when mature, scabrous on the keel, not twisted, flattish, commonly curved above.

Collected in the mountains about Manzanillo, December 1 to 31, 1890. No. 1084. This species differs from *A. tenuis flexuosa* in its culms being slender and flexuous, leaves softer, and spikelets with a few scattered hairs.

Aristida tenuis (?) (H. B. K.) Kunth, Rev. Gram. i. 62 (1829-1835); *Streptachne tenuis* H. B. K. Nov. Gen. et. Spec. i. 124 (1815). Manzanillo, January 9 to February 6, 1890. No. 1091.

Muhlenbergia exilis Fourn. Mex. Pl. Gram. 84 (1886). Along the banks of a creek. Colima, January 9 to February 6, 1891. No. 1271.

Sporobolus argutus (Nees) Kunth, Enum. Pl. i. 215 (1833); *Vilfa arguta* Nees in Mart. Fl. Bras. ii. 395 (1829). Very common along the coast. Agiabampo, October 3 to 15, 1890. No. 814.

Chloris radiata (?) Swartz, Prodr. Veg. Ind. Occ. 26 (1788). Common along water ditches. Colima, January 9 to February 6, 1891. No. 1253.

Bouteloua bromoides Lag. Gen. et Spec. Nov. 5 (1816). Common on grassy plains. Colima, January 9 to February 6, 1891. No. 1254.

- Bouteloua polystachya** (Benth.) Torr. Pac. R. R. Rep. v. pt. 2. 366, t. 10 (1857); *Chondrosium polystachyum* Benth. Bot. Voy. Sulph. 56 (1844). In rich valleys. Agiabampo, October 3 to 15, 1890. No. 791.
- Eleusine indica** Gaertn. Fruct. i. 8 (1788). On wet bottoms. Colima, January 9 to February, 1891. No. 1263.
- Cathestecum erectum** Vasey & Hack. Bull. Torr. Bot. Club, xi. 37, t. 45 (1884). Colima, January 9 to February 6, 1891. No. 1261.
A reduced form with short leaves and short flowering culms.
- Phragmites communis** Trin. Fund. Agrost. 251 (1820). Eight to ten feet high. Common about the margin of the lagoon. Manzanillo, December 1 to 31, 1890. No. 1092.
- Eragrostis pallida** Vasey, Contr. Nat. Herb. i. 285 (1893). Apparently annual; culms erect, more or less branched at the base, $1\frac{1}{2}$ feet high, smooth; leaves 2 or 3 on the culm, 3 to 5 inches long, erect, acuminate; ligule inconspicuous, truncate; sheaths shorter than the internodes; panicle 6 to 9 inches long, $\frac{1}{2}$ to $\frac{3}{4}$ inch wide, pale, strict, sometimes interrupted below, crowded above; branches unequal, semiverticillate, numerous, the longer $1\frac{1}{2}$ inches long, strict, all closely flowered to the base; spikelets 1 line long, 5-flowered; empty glumes less than $\frac{1}{2}$ line long, 1-nerved, subacute; floral glumes $\frac{1}{2}$ line long, subacute, 3-nerved.
Collected in a ditch. Colima, January 9 to February 6, 1891. No. 1268.
At first I thought this might be *E. alba* Presl, but it does not answer the description; neither does the Californian species, so called by Dr. Thurber, which is quite different from the present species.
- Eragrostis ciliaris** (L.) Link, Hort. Berol. i. 192 (1827); *Poa ciliaris* L. Sp. Pl. ed. 2. i. 102 (1862). In gardens. Colima, January 9 to February 6, 1891. No. 1266.
- Eragrostis plumosa**, (Retz.) Link, Hort. Berol. i. 192 (1827). Common on the low ground between the mountains and the lagoon. Manzanillo, December 1 to 31, 1890. No. 1085.
- Eragrostis diversiflora** Vasey, Contr. Nat. Herb. i. 285 (1893). Culms densely tufted, 2 to 8 feet high, firm, leafy at the base, lower leaves 6 to 8 inches long, gradually narrowed to long, setaceous points; sheaths smooth; ligule ciliate with long hairs; upper leaves distant, filiform; panicle spike-like, interrupted below, 7 to 10 inches long, $\frac{1}{4}$ inch wide, the nearly sessile branches densely crowded, interrupted and distant below, also on the same plant some panicles open and thinly flowered; spikelets linear, 3 to 4 inches long, 7- to 13-flowered or on less perfect culms reduced to 5, 3, or 2; outer glumes ovate, subacute, similar in texture to the floral glumes, which are ovate-lanceolate, rather thick, subobtuse, smooth, the lateral nerves not prominent.
Manzanillo, March 2 to 18, 1891. No. 1335. Here should be referred W. G. Wright's No. 1318, from Mazatlan, 1889.
- Eragrostis purshii** Schrad. Linnæa, xii. 451 (1838). In gardens. Colima, January 9 to February 6, 1891. No. 1262.
- Eragrostis purshii miserrima** Fourn. Mex. Pl. Gram. 116 (1886). Culms tufted, low, 3 to 6 inches high, branching from the base, often geniculate: leaves 1 inch long or less, very narrow; ligule short, ciliate; lower sheaths loose, striate; panicle 1 to $1\frac{1}{2}$ inches long, branches alternate, spreading, short (less than an inch long), each with 2 to 5 spikelets; spikelets $1\frac{1}{2}$ to 2 lines long, 5- to 9-flowered; floral glumes 3-nerved; the lateral nerves prominent. River bottoms. Colima, January 9 to February 6, 1891. No. 1273.
- Eragrostis purshii** Schrad. Linnæa, xii. 451 (1838). Manzanillo, December 1 to 31, 1890. No. 1088.
- Gouinia** Fournier (emended, description). Spikelets 2- to 4-flowered, narrow, approximate or somewhat distant, along the 2 sides of the triangular rachis, sessile or short-pedicelled, erect on the spreading branches of the rather large pan-

icles. Two lower glumes empty, somewhat unequal, shorter than the spikelet, narrowly lanceolate, purplish, keeled, awnless. Floral glumes somewhat larger, narrowly lanceolate, compressed, entire or 2-toothed at apex, awned, 3-nerved; the lateral nerves near the margin, and with the keel silky-ciliate below the middle. Rachilla pilose.—Perennial grasses with large panicles. Awns from the apex of the floral glume, straight, scabrous. M. Fournier adds: “staminibus 3, filamentis brevissimis, antheris longis, caryopsi libera, toto in dorso sulcata, apice bilobulata, macula hilari elliptico-ovali, stigmatibus sessilibus plumosis.” [Mex. Pl. Gram. 103 (1886).]

Differs from *Triodia* in the keeled, not rounded, floral glumes, in the fewer and less imbricate florets, and in the absence of the lateral teeth.

Tricuspis section *Neuroblepharum* Griseb. in Pl. Lorentz. p. 211.

To be compared with *Trichoneura* Andersson, which is referred by Bentham and Hooker to *Triodia*.

Gouinia polygama Fourn. Mex. Pl. Gram. 103 (1886). Culms rather slender, 2 to 3 feet high, rather leafy: leaves acuminate, 6 to 10 inches long, 4 to 6 lines wide, smooth above, somewhat scabrous below: panicles 8 to 12 inches long, the 10 to 15 branches single or rarely the lower in twos, 5 to 6 inches long, divergent, flowering uniformly nearly to the base with 10 to 15 spikelets: spikelets 2- to 3-flowered, appressed; empty glumes narrow, obtusish, the lower 2 and the upper nearly 3 lines long; floral glumes 3 to 4 lines long, gradually attenuated into a straight awn as long as itself or longer; palea nearly as long as its glume, acute, sparingly ciliate; grain oblong-linear, nearly two lines long, nearly cylindrical, with narrow furrow from base to apex.—Manzanillo, December 1 to 31, 1890. No. 1087.

I have an unpublished drawing of this plant from Paris by which it is easily recognized. M. Fournier enumerates the following localities and numbers: Vera Cruz, Gouin No. 76; Acapulco, Thiebaut No. 1042; San Augustin, Liebmann Nos. 501, 505; without locality, Karwinski No. 1000. Probably the reference to Florida, Karw. is an error. The following two species belong to the same genus:—

G. latifolia Vasey; *Tricuspis* (*Neuroblepharum*) *latifolia* Griseb. Pl. Lorentz. 211. Obtained from Cordoba, Argentine Republic, also No. 928 Morong's S. American collection.

G. mexicana Vasey; *Leptochloa* (?) *mexicana* Scribn. Proc. Phila. Acad. 1891. 302 (1891). This species is larger and more robust than either of the others, the culm almost reed-like, the leaves 8 to 10 lines wide, the panicle 1 foot long, the branches 7 or 8 inches long, with the lower one-fourth or one-third part naked, the spikelets 3- to 4-flowered, 4 to 6 lines long, with the awns one-third or one-half as long as the floral glumes.

No. 3252, collection C. G. Pringle, San Luis Potosi, Mexico.

Perhaps this is the *G. polygama major*, Fourn. Mex. Pl. Gram. 103 (1886). Vera Cruz, Gouin No. 77.

Jouvea straminea Fourn. Bull. Soc. Roy. Bot. Belg. xv. 475 (1876); *Rachidospermum mexicanum* Vasey, Bot. Gaz. xv. 110 (1890). Manzanillo, March 2 to 18, 1891. No. 1384.

FILICES.¹

Adiantum concinnum H. B. K. in Willd. Sp. Pl. v. 451 (1810). Found associated with No. 1126. Colima, January 9 to February 6, 1891. No. 1127.

Aspidium patens Swartz in Schrader's Journal ii. 34 (1801). Two or three plants of this were gathered with No. 1129. Colima, January 9 to February 6, 1891. No. 1129a.

¹The ferns and fern allies were determined by Prof. Daniel C. Eaton, of Yale College, who has also contributed critical notes on some of the species.

- Aspidium trifoliatum** Swartz, Syn. Fil. 43 (1806). This fern and the *Adiantum* (No. 1127) were found growing abundantly on a garden wall the top of which was channelled to convey a stream of water. Colima, January 9 to February 6, 1891. No. 1126.
- Gymnogramme calomelanos** Kaulf. Enum. Fil. 76 (1824). The common white-powdered form. Shady side of river banks under bushes and among rocks. Colima, January 9 to February 6, 1891. No. 1218.
- Lygodium mexicanum** Presl, Reliq. Haenk. i. 72 (1830). Climbing fern found in dark shady spots among trees and bushes on the mountains. Grows from 5 to 12 feet high. Manzanillo, December 1 to 31, 1890. No. 931.
- Notholaena brachypus** (Kunze) J. Smith, Ferns British & Foreign, 172 (1886); *Cheilanthes squarrosa brachypus* Kunze, Linnaea, xviii. 340 (1844). Shade of stone walls. Colima, January 9 to February 6, 1891. No. 1230.
- Pellaea rigida** (Swartz) Hook. Sp. Fil. ii. 144 (1858); *Pteris rigida* Swartz, Syn. Fil. 104 (1806). From a shady bank among bushes. Colima, January 9 to February 6, 1891. No. 1294.
- Polypodium elongatum** Mettenius, Polyp. 88 (1857). The plants are not in good condition, and the identification is somewhat doubtful in consequence. The fronds are 2 to 3 inches long, obovate-spatulate in outline, and dull yellowish-green in color. The fruit is very scanty, and forms small oblong sori near the tips of only a few of the fronds. Shady side of stone walls. Colima, January 9 to February 6, 1891. No. 1228.
- Polypodium incanum** Swartz, Syn. Fil. 35 (1806). Some of the specimens show a heavy coating of lacerate-ciliate and pointed scales on the lower surface of the frond; these are most observable on young fronds; in maturer fronds the scales are nearly entire and have mostly lost their acuminations. Found adhering to the shady side of stone walls. Colima, January 9 to February 6, 1891. No. 1229.
- Polypodium lanceolatum** L. Sp. Pl. ed. 2. ii. 1542 (1763). Mature plants much contracted by drought. The local name is "Lengua de Sierra para las calenturas." It is used as a remedy in cases of fever and ague. Found at the market at Colima. January 9 to February 6. No. 1409.
- Phegopteris tetragona** Mettenius, Fil. Hort. Lips. 84 (1856). On stone walls in shade. Colima, January 9 to February 6, 1891. No. 1129.
- Selaginella lepidophylla** Spring, Monogr. Lycopod. iii. 72 (1848). The natives call this "Flor de Piedra para la sangre," and employ it to check hemorrhages. Manzanillo, March 2 to 18, 1891. No. 1401.

MUSCI.

- Funaria hygrometrica** Sibth.* With *Philonotis* probably *fontana* Brid. Colima, January 9 to February 6, 1891. No. 1118. No. 1196.
- Philonotis fontana** Brid.* Probably, with a species of *Gymnostomum*. Both are sterile and not with certainty determinable. Colima, January 9 to February 6, 1891. No. 1197.

* Determined by J. H. Holzinger.

THREE NEW SPECIES OF SAPINDACEÆ FROM WESTERN MEXICO AND LOWER CALIFORNIA.¹

By L. RADLKOEFER.

Serjania (?) **albida** Radlk. sp. nov.; *Paullinia* (?) sp. Vasey et Rose, Contr. Nat. Herb. i. 82 (1890). Scandens, suffruticosa, parvula; rami (caules) tenues, sexangulares, angulis glabris, faciebus leviter canaliculatis, albide pulverulento-puberulis; corpus lignosum simplex; folia ternata; foliola parva, ovata, obtusa, subtrilobodentata, terminale in petiolulum longum anguste marginatum abrupte contractum, lateralia petiolulis brevioribus insidentia, omnia membranacea, pallide viridia, opaca, glabra, nec nisi glandulis microscopicis adspersa, punctis pellucidis obscurius notata, epidermide mucigera (paginae superioris quoque stomatibus instructa); petiolus (communis) brevis, nudus; thyrsi solitarii, folia subaequantes, rachi perbrevis; flores (non nisi insectorum ictu deformati suppetebant) parvi; sepala puberula.

Rami thyrsigeri diametro 1.5–2 mm., internodiis elongatis 5–7 cm., longis. Folia 3–5 cm. longa, 2–4 cm. lata; foliola terminalia petiolulo 1.5 cm. longo excluso 1.5–2 cm. longa, 1–1.5 cm. lata, lateralia minora; petiolus 6–15 mm. longus; stipulae minimae, subulatae. Thyrsi 3–6 cm. longi.

In California inferiore ad Santa Agueda: Palmer No. 263!

Observ. Affinis videtur *Serjanie* (?) *californica* Radlk. (v. Serj. Suppl. 1886. 139; *Cardiospermum*? sp. Gray), sed ut haec quoque quoad genus dubia est. An *Paullinie sonorensi* Wats., an *Cardiospermo spinoso* Radlk. congener?

Serjania brachylopha Radlk. sp. nov.; *Serjania* sp.? Watson, Proc. Amer. Acad. xxii. 403 (1887); coll. Palmer No. 381!

Scandens, fruticosa, ramis petiolisque sparsim crispato-pilosis vel subsetulosis, ceterum glabra; rami subtrigoni, 6-sulcati, cortice pallide subfusco; corpus lignosum compositum e centrali majore et periphericis 3 parvis angulos efficientibus; folia biternata; foliola lateralia ovato-oblonga, acuta vel inferiora obtusata, breviter petiolulata, terminalia late rhombea, acuta et mucronulata, in petiolulum contracta, omnia subduplicato-serrata, membranacea, reti venarum tenerrimo instructa, praeter nervos glabra nec nisi glandulis microscopicis adspersa, impunctata, epidermide mucigera; petiolus communis partialesque nudi; thyrsi solitarii, dense cincinniferi; cincinni stipitati, deformati pedicellorum supra medium articulorum articulis inferioribus stipitem aequantibus sat numerosis scopiformes; flores parvuli; sepala exteriori puberula, interioribus tomentellis fere dimidio breviora; fructus—

Rami thyrsigeri diametro 2.5 mm. Folia circ. 11 cm. longa, totidem lata; foliola terminali petiolulo 1-centimetrali excluso 5 cm. longa, 3.5 cm. lata, lateralia super-

¹The three following new species of Prof. Radlkofer were intended to form a part of my next report upon Dr. Palmer's Mexican plants. At Prof. Radlkofer's request, I have published them here so as to enable him to refer to them in his work on the order soon to appear.—J. N. ROSE.

iora 4 cm. longa, 2 cm. lata, inferiora plus dimidio minora; petiolus communis 2-3 cm. longus, partialium intermedius circ. 3 cm. lateralis 1 cm. longi; stipulae parvae ovato-triangulares. *Thyrsi* folia superantes, rhachi quam pedunculus communis longiore; cincinni circ. 8-flori, contracti, stipite 2.5-3 mm. longo suffulti, pedicelli circ. 4 mm. longi, supra medium articulati. *Flores masculi*: *Sepala* exteriora vix 2 mm., interiora 3 mm. longa. *Petala* e late obovato abruptius attenuata, 3 mm. longa, 2 mm. lata, intus glanduligera; squamae superiores crista brevi truncata, crenulata appendiceque deflexa brevi barbata, inferiores crista dentiformi instructae. *Tori* glandulae superiores ovatae glabrae, laterales minores subconformes. *Stamina* glabra, nec nisi breviora extus pilis singulis adspersa. *Germinis* rudimentum apice puberulum.

In Mexico septentrionali: Palmer No. 381! (Jalisco, Tequila, m. Aug. to Sept., 1886, flor.).

Observ. Habita accedit, ut jam Watson l. c. indicavit, ad *S. racemosam* Schum.; vera affinitas autem ei potius est, ut videtur, cum *S. mucronulata* Radlk. in eadem Sectione xi (*Physococcus*).

Cardiospermum spinosum Radlk. sp. nov. Suffruticosa, affinis *Cardiospermum tortuoso* Benth.; insignis cirris binis ad apicem pedunculi communis in spinas conversis, pedunculo inde apice furcillato ex angulo quasi furculae rhachin brevem cum floribus paucis, si qui sunt, protrudente, vel interdum omnino sterili ipsoque in spinam simplicem converso; rami thyrsigeri geniculato-flexuosi, tenues, e 5-6 angulari subteretes angulis vix prominulis subfuscis glabratiss, faciebus pulverulento-canopuberulis; folia e ternato folioli terminalis dissociatione transeuntia in 5-foliolato-pinnata; foliola superiora obovata, inferiora suborbicularia, parvula (vix 1-centimetralia), subsessilia, obtusa, subsinuato-crenata vel lobata nec nisi glandulis microscopicis et in nervis pilis singulis adspersa, crassiuscule membranacea, pellucide lineolata utriculis laticiferis sat crebris et plerumque venis approximatis, epidermide valde mucigera exceptis solummodo cellulis stomata in pagina superiore quoque numerosa (puncta albida efficientia) cingentibus; petiolus nudus; stipulae minutae, subulatae, thyrsi abbreviati, pauciflori; flores pro genere mediocres; sepalum 5 (?).

Rami thyrsigeri diametro 1 mm. vix superantes. *Folia* ramorum thyrsigerorum 2.5 cm. longa, summa minora; foliola 0.5-1 cm. longa. *Thyrsi* vix 1.5 cm. longi. *Flores masculi*: *Sepala* duo exteriora breviora, interiora 4 mm. longa. *Petala* obovata, in unguem latum attenuata, 4 mm. longa, 3 mm. lata, intus (densius quam extus) glanduligera; squamae (cristis exclusis) quam petala dimidio breviores, margine villosulae, superiores crista obcordata appendiceque deflexa medioeris dense barbata, inferiores crista obliqua instructae. *Tori* glandulae superiores ovatae, glabrae, inferiores minores, subannulares. *Stamina* adpresse puberula, apice glabra. *Germinis* rudimentum glabrum.

In California inferiore: Palmer No. 2! (La Paz, m. Jan. to Feb., 1890, flor.).

Observ. Affinis *Cardiospermum tortuoso* Benth., quod sepalis 5 quoque (ut e specimenibus a Brandegee in Magdalena Bay lectis patet) gaudet nec non foliis eodem modo ac in *C. spinoso*, supra quoque stomatibus numerosis instructis,

PLATE XXIV.

Forchhammeria watsoni Rose.

Fig. *a*, fruiting branch; *b*, flowering branch; *c*, sterile flower; *d*, seed. Figures *a* and *b* are of natural size; fig. *c* is enlarged 7 diameters; *d*, 2 diameters. Description on page 302.



FORCHHAMMERIA WATSONI ROSE.

PLATE XXV.

Forchhammeria watsoni Rose.

Fig. *a* and *b*, sterile branches showing leaves of different forms. Description on page 302.



FORCHHAMMERIA WATSONI ROSE.

A. Watson 1894

A. Watson 1894

PLATE XXVI.

Xylosma palmeri Rose.

The main figure illustrates a branch bearing fruit and female flowers; fig. *a*, staminate flowering branch; *b*, staminate flower; *c*, the same with sepals removed, exposing the disk; *d*, sepal; *e*, pistillate flower; *f*, the same with sepals removed; *g*, a flower with the ovary removed, viewed from above, showing sepals and disk. The dissections are enlarged 4 diameters. Description on page 303.

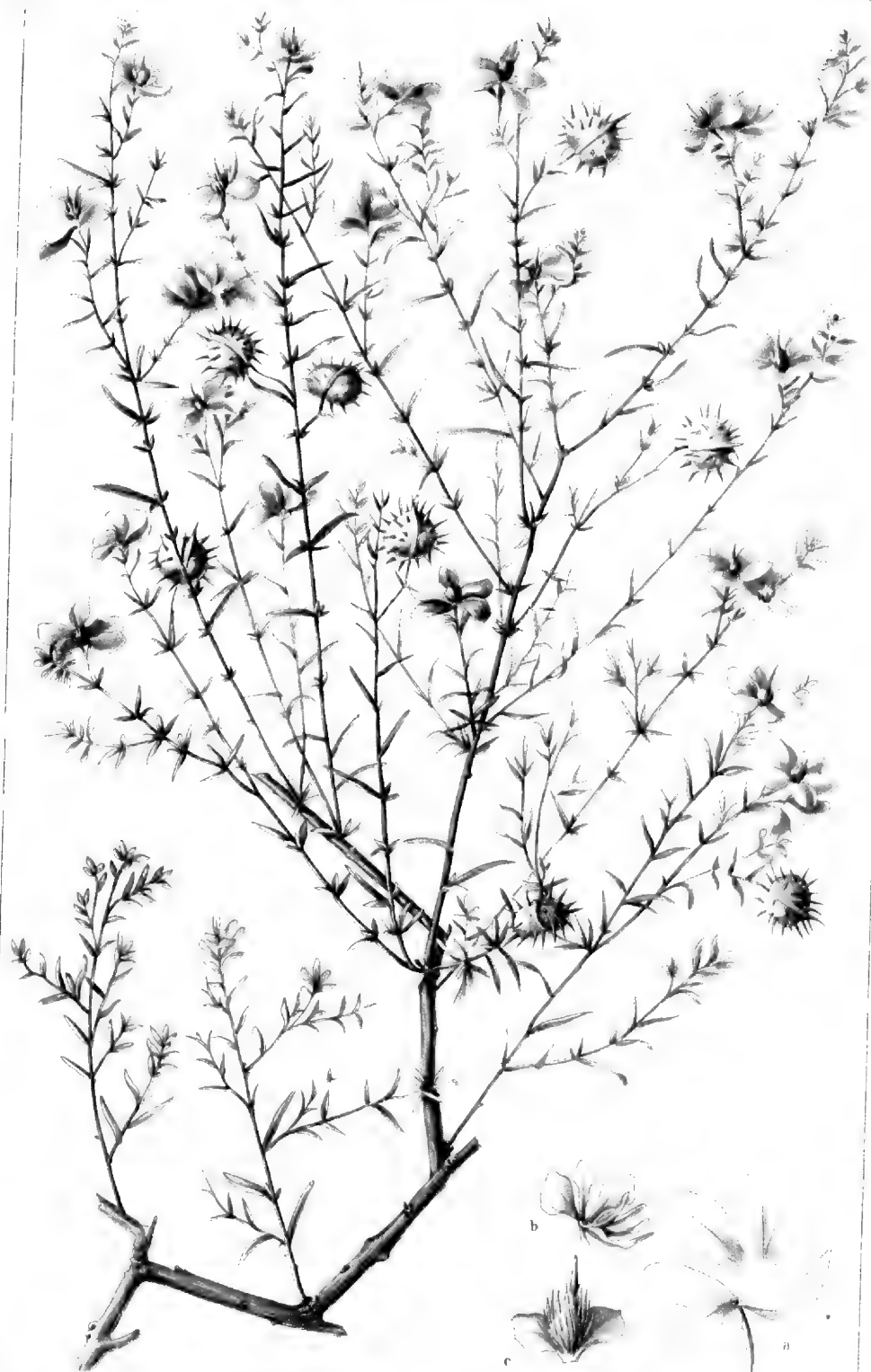


XYLOSMA PALMERI ROSE.

PLATE XXVII.

Krameria palmeri Rose.

Portion of plant, natural size; fig. *a*, the 5 sepals, disjointed; *b*, the 3 upper petals and the 4 stamens; *c*, ovary with two lower petals. Figs. *a*, *b*, and *c* are enlarged about 3 diameters. Description on page 304.



KRAMERIA PALMERI ROSE.

PLATE XXVIII.

Malpighia ovata Rose.

A branch showing flowers and leaves; fig. *a*, lower leaf showing venation, natural size; *b*, bud showing position and shape of glands, enlarged 3 diameters; *c*, fruit as seen from the side, showing the distinct styles; *d*, the fruit as seen from above. Figs. *c* and *d* are of natural size. Description on page 310.



MALPIGHIA OVATA ROSE.

PLATE XXIX.

Malpighia umbellata Rose.

A fruiting branch; fig. *a*, fruit; *b*, the same as seen from beneath, showing calyx and glands; *c*, a nutlet with fleshy covering removed. Figs. *a*, *b*, and *c* are enlarged 5 diameters. Description on page 310,



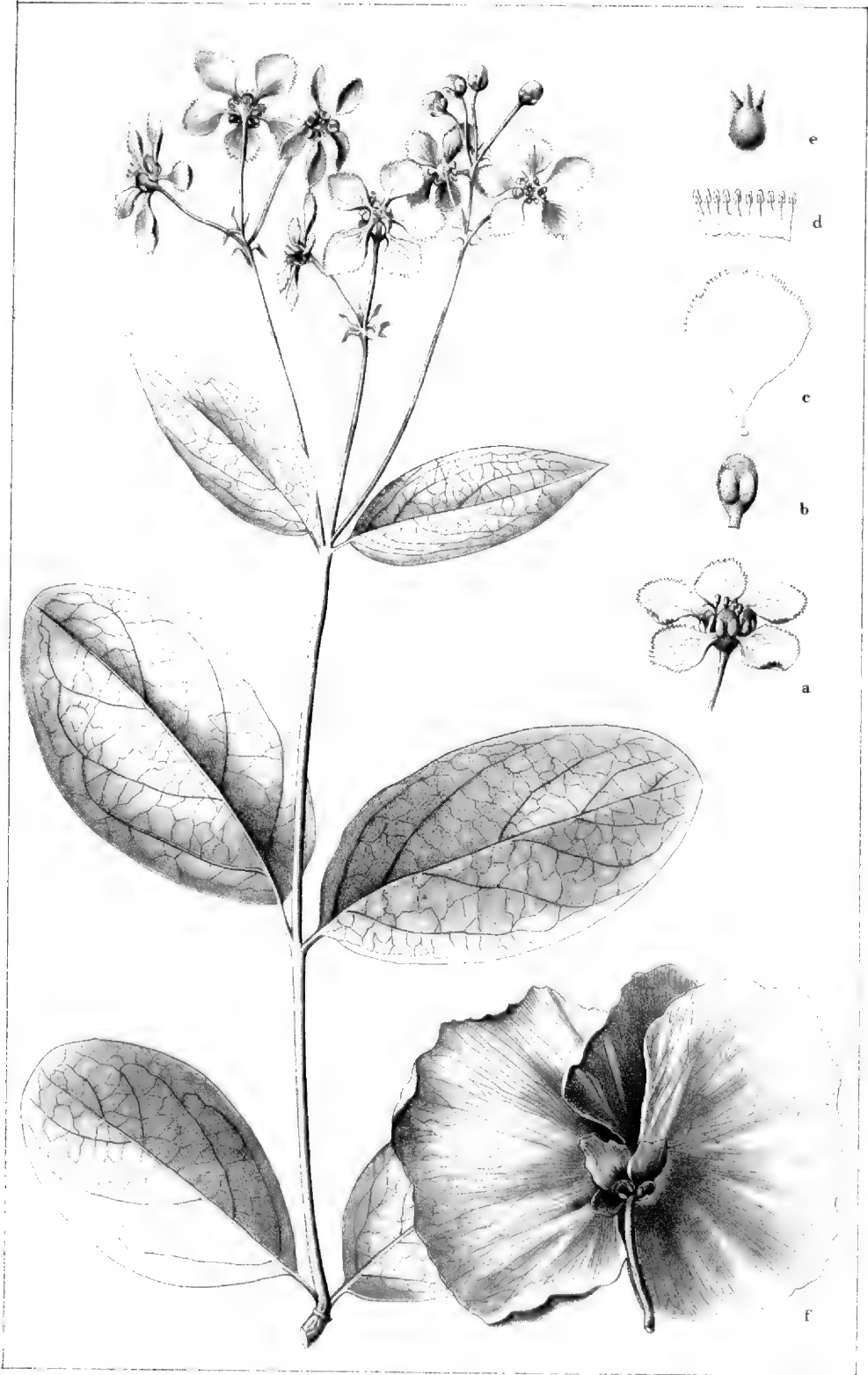
MALPIGHIA UMBELLATA ROSE.

B. Meisel, Lith. Boston.

PLATE XXX.

Hirca mexicana Rose.

Flowering branch, natural size; fig. *a*, an open flower, natural size; *b*, sepal with its two glands, enlarged 3 diameters; *c*, petal, enlarged 2 diameters; *d*, stamen tube spread out, enlarged about $2\frac{1}{2}$ diameters; *e*, ovary, enlarged about 3 diameters; *f*, fruit, natural size. Description on page 312.



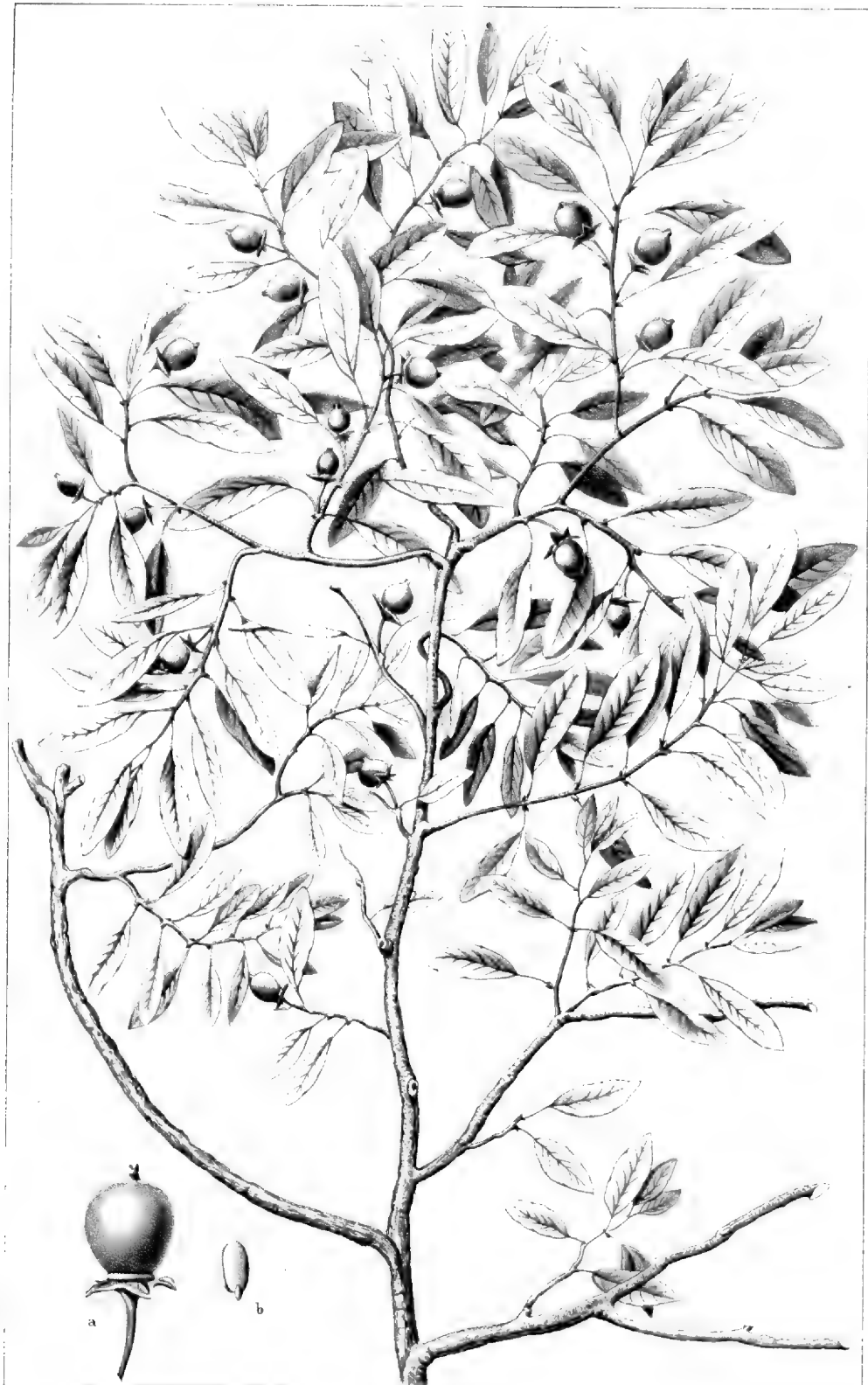
HIBAEA MEXICANA ROSE

1891

PLATE XXXI.

Karwinskia parrifolia Rose.

Fruiting branch; fig. *a*, fruit, enlarged $2\frac{1}{2}$ diameters; *b*, embryo, enlarged 2 diameters. Description on page 315.



KARWINSKIA PARVIFOLIA ROSE

B. Metzel. Hb. Boiss.

PLATE XXXII.

Agiabampoa congesta Rose.

A flowering branch; figs. *a* and *b*, ray flowers; *c*, disk flower with bract; *d*, style branches; *e*, involueral bract. Figs. *a* and *b* are enlarged 2 diameters; *c*, 3 diameters; *d*, 10 diameters; *e*, $2\frac{1}{2}$ diameters. Description on page 335.



F. Müller, del.

AGIABAMBOA CONGESTA ROSE.

B. Meisner, lith. Baster.

PLATE XXXIII.

Tridax dubia Rose.

A flowering branch; fig. *a*, ray flower, enlarged about 4 diameters; *b*, disk flower, enlarged about 4 diameters; *c*, paleæ of the pappus, enlarged about 10 diameters. Description on page 337.



A. M. C. del.

TRIDAX DUBIA ROSE.

B. Menzel, lith. Boston.

PLATE XXXIV.

Porophyllum palmeri Rose.

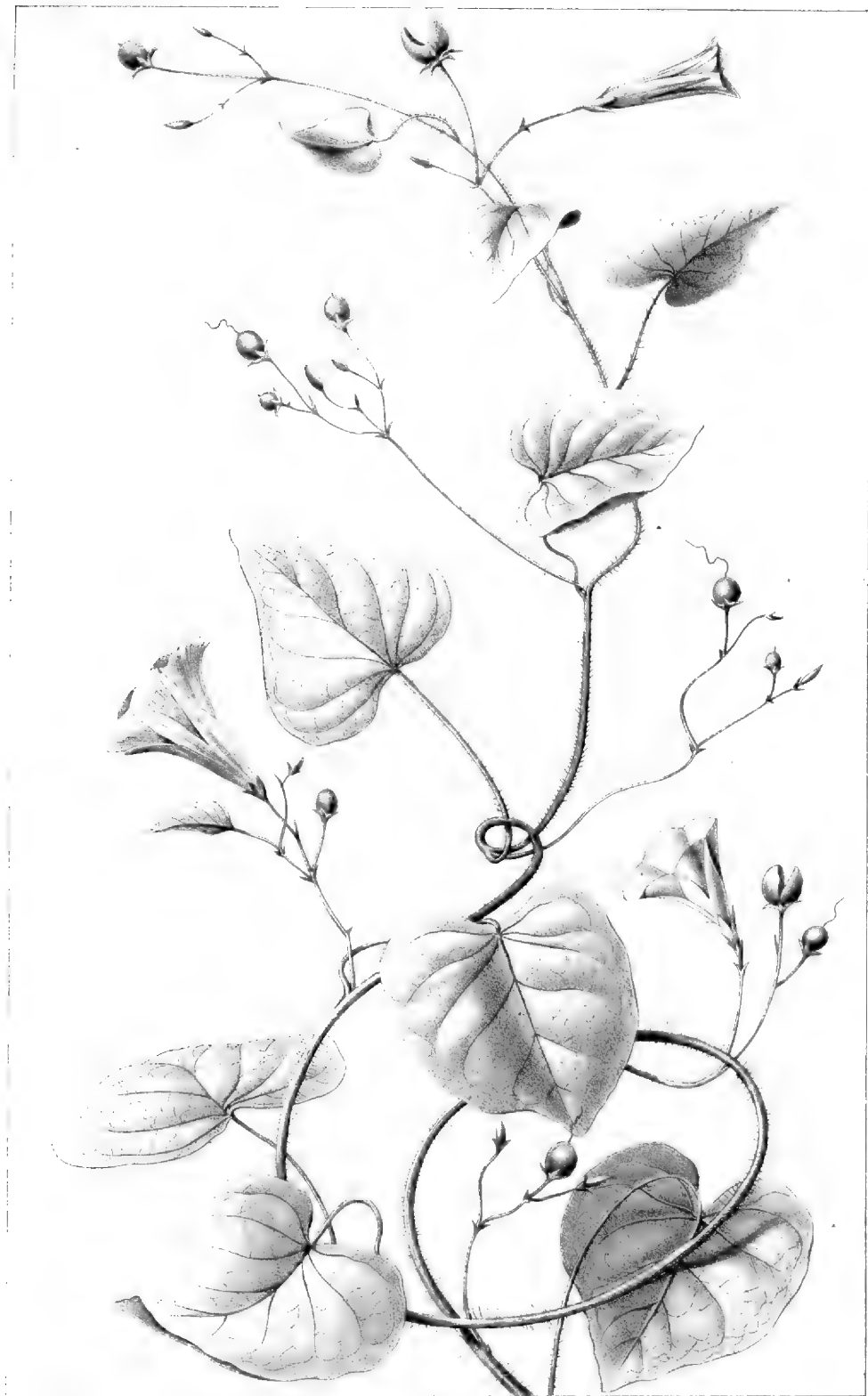
A flowering branch, natural size; fig. *a*, flower, enlarged about 3 diameters; *b*, an akene with pappus, enlarged about 5 diameters. Description on page 338.



PLATE XXXV.

Ipomoea nelsoni Rose.

A branch, showing flowers and fruit, natural size. Description on page 343.



IPOMOEA NELSONI ROSE.

B. M. S. L. N. H. B. S. T. O. M.

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